THE MACHINE AT THE CROSSROADS

Art, academia, and culture before the challenges posed by the new emerging events and technologies of the 21st century: evolution and adaptation

Martín López Román

Directors:

Augusto Pedro Zubiaga Garate

Francisco Javier Araujo Barón

eman ta zabal zazu

UPV   EHU

THE MACHINE AT THE CROSSROADS

*Art, academia, and culture before the challenges
posed by the new emerging events and technologies of
the 21st century: evolution and adaptation*

Martín López Román

Directors:

Augusto Pedro Zubiaga Garate

Francisco Javier Araujo Barón

DEPARTMENT OF SCULPTURE AND OF ART AND TECHNOLOGY

eman ta zabal zazu

Universidad
del País Vasco

Euskal Herriko
Unibertsitatea

FACULTY
OF FINE
ARTS
UNIVERSITY
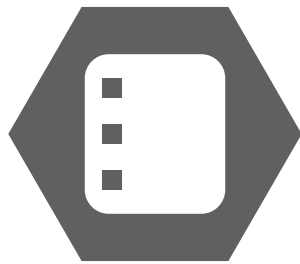OF THE BASQUE
COUNTRY

BILBAO
2022

I live on Earth at present, and I don't know what I am. I know that I am not a category. I am not a thing — a noun. I seem to be a verb, an evolutionary process — an integral function of the universe.

Buckminster Fuller, 1970

0 Index

0.1 Table of Contents

0.2 Table of Figures

1 Acknowledgements

1.1 Acknowledgments

First and foremost, I would like to thank my research tutors, *Augusto Zubiaga* and *Patxi Araujo*, for helping me conceive and realize this project, and especially for letting me realize it in a way tuned to my nature and perception of the world; I'm also grateful to my good old friend *Pablo Moyano*, for his constant interest in my work, and for being an always reliable consultant in all matters related to the emerging technologies of our time; I would also like to thank my family, Ana Román, Edu López, and María López, for accompanying me through the realization of this research project, as I believe that I would not have been able to endure this last four years without their constant patience and interest. I hope that the many introspective walks through the park we took this last years proved to be as rewarding to them as they were to me.

2 Abstract
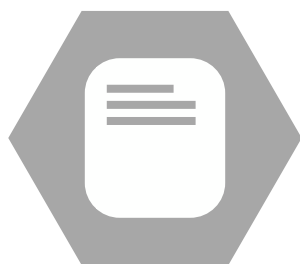
2.1 Abstract

The advent of the many emerging crises of our time, and of the many emerging technologies that are set to define the short-term future, pose a series of challenges that could heavily disrupt social and economic structures worldwide if they are not addressed in a sensible and timely manner. This research project aims to analyze and expose how the artistic, academic, and cultural disciplines could adapt and evolve in the face of this situation, with the goal of generating a knowledge base that could be utilized to progressively redefine said disciplines in a way that would allow them to help our species overcome the challenges posed by the future in a significant manner. The data for this project was collected through the qualitative study and cross-analysis of hundreds of relevant articles and studies. This study unveils that these emerging challenges are extraordinarily intricate and dangerous in nature, and uncovers that their root cause resides in the continued inability of our species to reconcile its tribal legacy with the ever-evolving nature of technology, concluding that contemporary societies are critically underprepared to handle these challenges sensibly. Possible solutions to this situation determined by this project include the proposal for a redefinition of the artistic, academic, and cultural disciplines conducted in tune with our tribal nature and the nature of technology that makes use of social networking structures based on the patterns that define naturally occurring evolutive emergent systems to reconcile said natures. Other themes analyzed by this study include the relevance of the artistic mindset as a vital aspect of the human being, the necessity of sensibly democratizing the new emerging technologies, and the potential occurrence of an evolutive emergent in the foreseeable future as a consequence of human interaction and organizational complexity reaching a sustained critical mass. These findings indicate the need for the realization of a progressive redefinition of the artistic, academic, and cultural disciplines conducted in tune with our tribal nature and the nature of technology, as well as the need for the immediate recognition and addressing of the many emerging challenges of our time by the international community.

3 Introduction
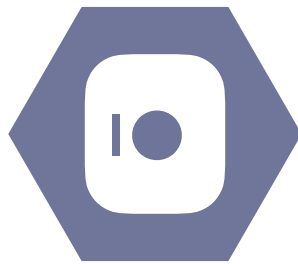
3.1 Overture

Imagine yourself in front of a crossroads.

An entity stands immovable in the middle of this crossroads, the machine, in all of its past, present, and future forms, the fruit of both our greatest works and the most insignificant daily actions, as well as of our most rational ideas and our wildest dreams: an emergent gestalt of all that we have been, of all that we are, and of all that we could be.

Behind the machine, a multitude of constantly dividing paths extend into the horizon. To the future. To our future.

The machine awaits, patiently, for us to come to it.

What will we do with it?

What will we make it be?

What will we ask from it?

_____

What do you feel when you think of the future? What do you think when you feel something for the first time? What would you like to unveil from the unknown? How far would you go to unveil it? How far would you go to hide from it?

What does the world around you make you feel?

What does it make you think?

What is that that you fear the most?

What is that that you despise the most?

What is that that you desire the most?

What does make you feel alive?

How would you try to make the world a better place if you could?

Does the end justify the means?

Where will our journey take us?

The future, are we losing it? Maybe. Maybe we lost it before we even had a chance to start finding it. Maybe not. Perhaps we just don't want to think about the future. The future is unknown. We like the known; we like the now. The now is known, and even if it can be harsh at times, it can give us solace and comfort. The known can provide meaning to our life, but the unknown is a mystery. We fear it, for it is not what we are.

Can we blame ourselves for not wanting to leave the now behind? Many of us simply can't afford to.

Perhaps, but in truth, it is not our choice to make. The future always comes, whether we want it or not.

Then, what do we want that future to be?

What do you want the future to be?

When I was a little kid, I was fascinated by the prospect of the world of tomorrow. I fantasized about futures filled with beautiful green forests, oceans of crystal clear water, and gleaming arcologies extending up into the sky. I dreamed of impossibly beautiful machines capable of making everyday life so much more interesting, with an uncharted cosmos filled with wonder and the spaceships that could take us to it. I found many stories, books, films, music, and video games that explored those concepts, and thus I fell in love with science fiction from a very young age.

This fascination came to me in grand part thanks to my mother, the artist Ana Román, and her fascination with the world of machines and robotics, and thanks to my father, the artist Edu López, and his constant works relating to architecture. They introduced me to the world of culture and art even before I had learned to speak correctly. As little more than a toddler, art exhibitions were almost as familiar to me as going out for a walk in the park. In those first years of my life, I became a very curious child, someone who always wanted to know as much as he could from the world. I learned to think for myself, treat others with emotion and tenderness, observe and learn from the world around me, and utilize what I had discovered to unleash my imagination.

If one can take my parent's word as true in this regard, I was a happy, independent, humorous and tender child back then, a kid with a very strong personality and an immense curiosity. Yet, not very long after that, I had to venture to primary school, and when I did so, I was introduced to the actual reality of the world, a world that, as seen from the eyes of a child, would judge you for being who you were, a world that would placate even your slightest glimpse of self-determination and imagination.

There was no real emotion in that place, no sympathy; there were only rules, goals, and deadlines. And you were judged, you were judged for even the most insignificant of things, for the slightest behavioral deviation, and you were judged by persons, even other kids, who did not care about you at all, and who, more often than not, did not deserve the power they had. From the viewpoint of the little kid I was back then; I learned that the world was an automaton factory, a place that would try to strip you of every bit of personality and self-determination you had, only to replace them with a personality model of what society believed was the ideal citizen.

Nevertheless, there were also good people in that world, people whose company and mentorship helped me navigate what was, at least for me, a nightmare made real. In the end, I endured, but lost a part of my personality in the process. I became way less open to others, less trusting, and more reclusive and dependent on those few I trusted, and I almost completely lost my sense of humor. At least my curiosity, creativity, naïveté, and passion survived unscathed. Most of all, however, it was then that I became aware of the world's hypocrisy, and I learned never to judge others if I could.

Not long after that, I started to realize that the world at large, the one that awaited me beyond the confines of infancy, was just like the one I had experienced so far: most of it was composed of people who were just trying to have an everyday life and did not care about anything beyond what concerned their daily life. I also discovered that an alarming number of individuals would exploit everyone and everything around them for personal gain, that most of those who occupied the higher echelons of society counted among them, and that there was little a common person could do to change their behavior. This world also had a lot of good people on it, people you could rely on, which gave me enough solace to accept it to the best of my ability.

Then, as I grew up a little more, I learned of the many social inequalities that plagued our civilization. I became aware of the tremendous privilege I had enjoyed throughout my life just by being born in a first-world country. Soon after, in part thanks to my parents and in part driven by my curiosity, I discovered the persons who, in relatively recent times, had tried to make the world a better place, a place, perhaps, not that different from that image of an amazing future I had had in my mind as a little kid, people like B*uckminster Fuller* and the creators of *the Black mountain college*, people like *Paolo Soleri* and his *Arcosanti Initiative*, like *Jacque Fresco* and his *Venus*

Project. For many years, I believed that it could be possible for a small number of persons, or even a single one, to make the world better in a significant way if they had enough resources and initiative to do so. To be frank, I admired those people; I wanted to be like them, I wanted to polish my vision for a future and share it with the world, and I dreamt of making that vision a reality.

Then I grew up a little more, studied a little more, and enjoyed a bit more fiction. I dived deep into the story of our species, and in doing so, I discovered the works and ideals of all the great thinkers. I learned from their points of view, their proposed great plans, what they had contributed to the world, and from their mistakes. I understood that the world was nowhere near as simple as I had thought it was and that it was naive to believe that a single person, no matter how intelligent and benevolent they could be, would be able to understand it enough to devise a way to make it a better place for the whole of the human species and the Earth. I comprehended that to venture into the future; we didn't need glorious prophetic leaders that would lay the path for us to follow nor synthetic intelligences that would define every aspect of our lives in the name of efficiency; I understood that what we truly needed was for every human to think for themselves, in a sensible, passionate, empathetic and synergic way.

At this moment, I realized the value culture and art had for both ourselves and the whole of society, and I understood that both disciplines were likely going to play a very significant role in defining the world of tomorrow, for better or worse. This personal discovery was enough to steer me away from my planned studies in architecture in favor of venturing into my studies in audiovisual communication and those in culture, art, and technology further down the line.

In these last years, I have learned many things, from the conflicting nature of objectivity to the fundamental workings of society and how to interpret it. Still, most importantly, I have learned, at least to some degree, who I am as a person, where I stand in the world, and what I would like to do with my time. I am, first and foremost, an artist, a story-maker, a filmmaker, and a poet, if you will, but I'm also a philosopher and a researcher. I am, in essence, a romantic rationalist lost between the world of art and technology, of culture and science, someone who looks into the future and the unknown with awe, desire, and fear, hopeful for what is to come, and afraid of what we may make of it.

What do I want to do with my time then?

I want to help us find the machine at the crossroads, and I want to help us make it our friend.

Now well, you are probably wondering what that means.

Let us start then.

3.2 Research Topics

Which ones are the research topics of my dissertation?

This dissertation is focused on identifying possible ways through which the artistic, cultural, and academic disciplines could evolve to help us overcome the challenges posed by the emerging events and technologies that will define the short and mid-term future, with the goal of not only successfully solving said challenges but of doing so in a way that could help our species shape the world of tomorrow in a sensible way that does not require an abandonment of its identity.

The subjects this topic will explore are as follows:

1. *The nature, current state, and possible evolutionary patterns of human culture regarding the short and mid-term future.*

2. *The nature, current state, and possible evolutionary patterns of human artistic practices regarding the short and mid-term future.*

3. *The nature, current state, and possible evolutionary patterns of human academic institutions regarding the short and mid-term future.*

4. *The nature, current state, and possible evolutionary patterns of human scientific institutions regarding the short and mid-term future.*

5. *The democratization of cultural, artistic, academic, and scientific disciplines.*

6. *The synergic hybridization of cultural and artistic disciplines with scientific disciplines.*

7. *The exploration of the possible roles of cultural and artistic disciplines in facing the challenges posed by the future.*

8. *The nature of universal human rights and the possible ways they could be redesigned in relation to the present time and the short and mid-term future.*

9. *The conceptualization of a universal, multidisciplinary cultural, artistic, academic, and scientific network in the shape of a natural neural network, created as a platform to further both the development of a democratized, positive, non-imposing, universal human culture and the creation of an interdisciplinary platform that can help humanity identify, understand and face the challenges of the future.*

The **underlying topic** is that of identifying and studying the socio-economic, technological, and natural subjects that will more than likely define the future of our species for the short and mid-term future, both in regards to their possible positive and negative aspects, with the interest of elaborating an approximate image of what the world of tomorrow could be like if current socioeconomic and natural trends continue.

Apart from being a valuable topic in its own right, this research is essential for contextualizing and elaborating the core topic. The information it will provide will be vital in identifying how art and culture could help our species overcome the challenges of tomorrow.

The subjects this topic will explore are as follows:

1. The development and social adaptation of emerging technologies and practices related to the fields of Computing, Communication, and Surveillance technologies, these being the fields of Automation, Artificial Intelligence, Quantum Computing, The New Information Networks, Augmented reality, The Internet of Things, and Advanced Surveillance Technologies.

2. The development and social adaptation of emerging technologies and practices related to Planetary restoration, Environmental Sustainability, and General Human Habitability, these being the technologies associated with Sustainable Ecological Development, Ecological and Climate Restoration, and Geo-Engineering technologies.

3. The development and social adaptation of emerging technologies and practices related to the exploration, exploitation, and possible colonization of new frontiers for the human race, including Outer Space, Unexploited Earth Environments, and Virtual Realities.

4. The development and social adaptation of emerging technologies and practices related to New Generation Engineering, being these Fast Prototyping techniques, Nano-Engineering and Giga-Engineering.

5. The development and social adaptation of emerging technologies and practices related to human body modification and augmentation, these being Life quality and Life Extension technologies, Synthetic breeding, Genetic Tailoring, Cybernetic and Bionic Augmentation, and Intelligence Augmentation technologies.

6. *The evaluation of the possible impacts the new emerging technologies could have on human society and how they could interact with human culture and artistic disciplines.*

7. *The studying and understanding of the concepts of Super Intelligences and Technological Singularities.*

8. *The studying and understanding of present and upcoming civilization threatening challenges and disasters caused by entirely natural means, including the topics of dangerous biological outbreaks, solar flares, asteroid impacts, super-volcanoes, and general natural disasters.*

9. *The studying and understanding of present and upcoming civilization threatening challenges and disasters caused by human activity, being chief among them the topics of climate warming and destabilization, ecological degradation, dangerous biological outbreaks, space isolation caused by the Kessler syndrome, resource scarcity, human overpopulation, increase in social inequality, increase in human aggression, human obsolescence caused by automation and artificial intelligence, human intelligence degradation caused by irresponsible utilization of the new technologies, and the continued degradation of human diversity caused by extreme cultural globalization.*

The **overlaying topic** is that of studying and analyzing the concept of life, intelligence, and consciousness as emergent behaviors, in the context of trying to understand if an evolutive emergent behavior could be born from the synergy of human-caused interactivity when said interactivity reaches a

critical mass. The concept of evolutive emergence will be studied to conceptualize a hypothetical interdisciplinary cultural network inspired by those systems that could potentially help foster a positive human evolutive emergence. As I consider this topic too complex to be tackled sensibly within the scope of a doctoral thesis conducted by a single individual, the findings derivate from its studying will be utilized to propose further research projects, not to construct possible concrete solutions.

The subjects this topic will explore are as follows:

1. *The concept of emergence, studied from a scientific point of view, and its relation with Darwin's theory of evolution, the General System Theory, Computer Sciences, and Neurological sciences.*

2. *The concept of emergence studied from a philosophical and ideological point of view.*

3. *The concept of evolution, in the context of the emergence of life, intelligence, and consciousness, studied from a scientific point of view.*

4. *The nature of human-caused social emergent behaviors, and their relation to evolutive emergents.*

3.3 Research Focus and Scope

With all the topics this dissertation tackles, which one is the primary main focus then?

The **main focus** of this dissertation is to identify and explore the possible ways in which art, academia, and culture could help the human species sensibly overcome the many natural and artificial challenges the next one hundred years will bring forth. This research will also help identify how art, academia, and culture could evolve over the next one hundred years.

There are many other topics the dissertation will study, but as I have explained previously, those non-core topics are not the main focus of the dissertation. On the one hand, the **underlying topics** are tackled contextually, as their analysis is necessary to develop the core topics properly, but they are not the main focus of the dissertation. On the other hand, the **overlaying topics** are posed not as a core aspect of the dissertation but as a proposal for further research, a foundation from which a new research project focused on the study of a potential human-caused evolutive emergence could be conducted.

While **the scope** of the thesis may appear too expansive at first glance, it is essential to comprehend that only the core topics will be developed extensively in its developmental stage. Ultimately, the whole of this research project will be contained within the fields of **cultural studies** and **future studies,** in tune with the artistic, cultural, and academic disciplines. The studying of the other subjects will be conducted more superficially, and only to obtain a contextual foundation from which to build the main postulates.

3.4 Research Context and Relevance

Is the topic I have chosen to research relevant to our time?

Definitely, because this topic addresses the most significant emerging challenges that are set to define our world for the next one hundred years. What's more, I argue that there will not be a better time to conduct this research than the present day, for the volatile and unpredictable nature of these challenges demands that we prepare ourselves for their arrival before they reach a critical point.

Is the topic I have chosen to research relevant to the fields of art, academia, and culture?

Without a doubt. Even if the broader topic this dissertation addresses is that of the emerging challenges of our time, its goal is to determine how the artistic, academic, and cultural disciplines could evolve to help our civilization overcome these challenges.

Is my thesis relevant to a broader problem or debate?

This dissertation provides an interdisciplinary perspective on how we could address the emerging challenges of our time from an artistic, academic, and cultural standpoint. This directly concerns many of the problems and debates that define contemporary cultural, social, and future studies.

3.5 Research Questions

Due to the interdisciplinary nature of my thesis dissertation, its research questions are organized into two primary categories, the **contextual questions,** that explore both the underlying and overlaying topics of the thesis and exist to provide the context necessary to allow the main research to be conducted, and the **core questions,** that are the central research questions of the thesis. It is important to remark that regarding standardized academic practices, only the core research questions should be considered true research questions. While essential for the research, the contextual questions will be addressed in a more limited manner.

3.5.1 Contextual underlying questions, emerging technologies:

1. *Which are the most impactful emerging technologies of our time?*

2. *When will the development of these technologies conclude? When will their use be generalized?*

3. *In which ways could those technologies affect human society in positive ways? And in negative ways?*

4. *Is human society ready to utilize these emerging technologies in a generally positive, equitable, and responsible way?*

5. *How can we better prepare ourselves for their arrival?*

6. How could these new technologies interact with the cultural, educational, and artistic disciplines?

3.5.2 Contextual underlying questions, emerging challenges:

1. Which are the most relevant, civilization-threatening emerging natural challenges of our time?

2. Which are the most relevant, civilization-threatening human-caused emerging challenges of our time?

3. How can we better prepare ourselves to face those challenges?

4. How could the cultural, academic, and artistic disciplines help us overcome those challenges?

3.5.3 Contextual overlaying questions, emergence, and neural networks:

1. Can life and intelligence be explained as weak emergence? Which ones are the different scientific opinions in this regard? Can consciousness be explained as weak emergence? Which ones are the different scientific opinions in this regard?

2. What are the factors that trigger evolutive emergent behaviors from the interactivity of simpler systems?

3. Can human social structures be understood as emergent behaviors?

4. Could human interaction trigger an evolutive emergent behavior? Could such an emergence be positive or negative?

5. Would it be possible to create cultural, artistic, academic, and scientific interdisciplinary networks that mimic the structures capable of generating positive emergent behaviors?

3.5.4 Contextual core questions:

1. How could cultural and artistic disciplines evolve for the next one hundred years if current socio-economic trends and technological innovations are maintained?

2. How could academic disciplines evolve for the next hundred years if current socio-economic trends and technological innovations are maintained?

3. How could human socio-economic structures evolve over the next one hundred years if current trends and technological innovations are maintained?

3.5.5 Core research questions:

1. In which ways could education and academia help us make more responsible and equitable use of the new emerging technologies? In which ways could education and academia help us face the challenges of the future? How could education and academia adapt to the world of tomorrow sensibly?

2. In which ways could culture help us make more responsible and equitable use of the new emerging technologies? In which ways could culture help us face the challenges of the future? How could culture adapt to the world of tomorrow sensibly?

3. *In which ways could art help us make more responsible and equitable use of the new emerging technologies? In which ways could art help us face the challenges of the future? How could the artistic disciplines adapt to the world of tomorrow sensibly?*

4. *How could we make the cultural, artistic, and academic disciplines and institutions more appealing and accessible to the general population?*

5. *Is it possible for a non-imposing universal human culture to exist? How could such a culture be created? Would such a culture be beneficial to human civilization?*

6. *How could we create a universally accessible digital environment capable of synergistically integrating the cultural, artistic, academic, and scientific disciplines? Would shaping such a network in the form of an emergent network benefit human civilization?*

4 Methodology

4.0 Introduction to Methodology

Choosing a research methodology for my dissertation proved to be simultaneously more straightforward and more complicated than I initially expected, in significant part as a consequence of the highly interdisciplinary nature of the project, but also because of the influence of many external factors that completely escaped from my control. Choosing what methodology to utilize didn't pose that much of a problem, but adequately selecting what data collection methods to follow turned up to be a way more frustrating experience than I had thought when I realized that I simply didn't have access to the resources I needed to collect the data I needed in the way I originally envisioned.

4.1 Research methodology, data collection methods, and referencing system: Qualitative research and Harvard referencing

● ———————— ○

The research methodology I chose for my dissertation was the *Qualitative Research Method*, as I judged that, because of its interdisciplinary nature, and because most of these questions were directly or indirectly concerned with cultural, social, and artistic developments, the best way to answer <u>my research questions</u>[3.5] would be to collect, analyze and contrast the qualitative data and information that I identified as relevant to the answering of these questions. While there are topics studied by this dissertation that are of a quantitative nature, such as the development of the new emerging technologies or the evolution of emergent systems, I judged that even in those cases, it would be more appropriate to utilize the qualitative research method than the quantitative one, as my research was more concerned with the potential social and cultural consequences of the developments caused by those fields than their discoveries on themselves.

In what corners the **data collection methods** I chose to follow, I quickly determined that, because of the interdisciplinary nature and extensive scope of my project, it would not be feasible to explore every single topic relevant to my research questions with the same amount of focus. Therefore, I concluded that the optimal path was to utilize first-hand data collection only to address the core research questions, as I did not have the time or resources necessary to collect new data to answer the contextual questions, and I judged that the analysis of existing data would suffice to do so sensibly.

In what concerns the collection, studying, and contrast of existing data, I simply chose to search for studies that addressed my research questions. I determined that by identifying and analyzing a sensible number of relevant studies per each of my studied topics, and by contrasting the information provided by those studies with each other, I would be able to answer my contextual research questions effectively while also being able to provide a foundation on which to conduct the data collection necessary to answer the core research questions.

In what concerns the collection of new data, I concluded that by conducting a series of surveys and interviews with relevant parties and individuals, I would be able to collect the data required to answer my core research questions fully. To this end, I prepared a series of video interviews directed to those field experts that I judged would provide objective and valuable information that I could use to answer my research questions. I also designed a survey, which was to be distributed to the general population through academic and social channels, to reinforce and contextualize the answers provided by those experts.

Lastly, in what corners the **reference methodology** I chose for my dissertation, I opted for utilizing the **Harvard Referencing System**, for it was the referencing system with which I had the most experience.

4.2 Research limitations: Lack of resources and external factors

In what concerns the recollection and analysis of pre-existing data, while the process itself proved to be straightforward, I did, unfortunately, run into a very significant roadblock that prevented me from performing it to the extent that I had initially planned: many of the articles and studies that I identified as potentially useful for my research were gated behind subscription services that were too expensive for me to afford. While my researcher credentials allowed me to access some of those platforms free of charge, which allowed me to proceed with my research, a non-insignificant number of them didn't recognize them as valid, restricting me from gaining access to them. In the end, I did manage to gain access to enough articles and studies to complete this aspect of my research. However, as some of the studies I needed were paywalled, I had to utilize third-party analyses of those blocked articles to obtain all the information I needed.

In what concerns the recollection of new data, I found significantly more challenges to conduct it than when recollecting existing data. On the one hand, I quickly discovered that most of the individuals I wanted to interview wholly ignored my requests. In contrast, those who answered those requests did so to point out that they didn't have the time necessary to participate in my study. On the other hand, the emergence of the 2020 global pandemic prevented me from performing the surveys I had prepared, because the health crisis heavily disrupted the academic channels I was going to utilize to conduct them. Besides, I judged that even if said channels had worked, the significance of the pandemic would have biased

the results of my surveys too much for them to be of use to my research.

In the end, as I was unable to properly proceed with any of my planned methods to collect new data, and as I was pressed to continue with my research at risk of the project stagnating otherwise, I decided to abandon said initiatives in favor of dedicating more time to the recollection and analysis of existing studies and data. I judge that this decision, even if somewhat desperate, proved to be the correct one in the end, as it allowed me to progress with my research.

5 Literature Review

5.0 Introduction to Literature Review

Writing a literature review is always daunting, much more so when a research project's focus is interdisciplinary. In the case of my research, finding the appropriate literature to review has indeed been a complex and cumbersome endeavor, although not necessarily a difficult one, as I was already familiar with the studies, authors, and institutions that I identified as suitable for the task at hand. However, soon after I started to write this review, I realized that because of the many topics my thesis encompasses, it was not feasible, nor desirable, to conduct an in-deep analysis of every single one of them. In the end, I decided to dedicate the same amount of time to studying the whole of the contextual topics as I did to studying each of the core ones.

Emerging technologies

Emerging challenges

Evolution, Emergence, and Natural Neural networks

Contextual Topics

Contemporary culture

Contemporary art

Contemporary academia

Core Topics

Literature Review

Literature Review, Outline
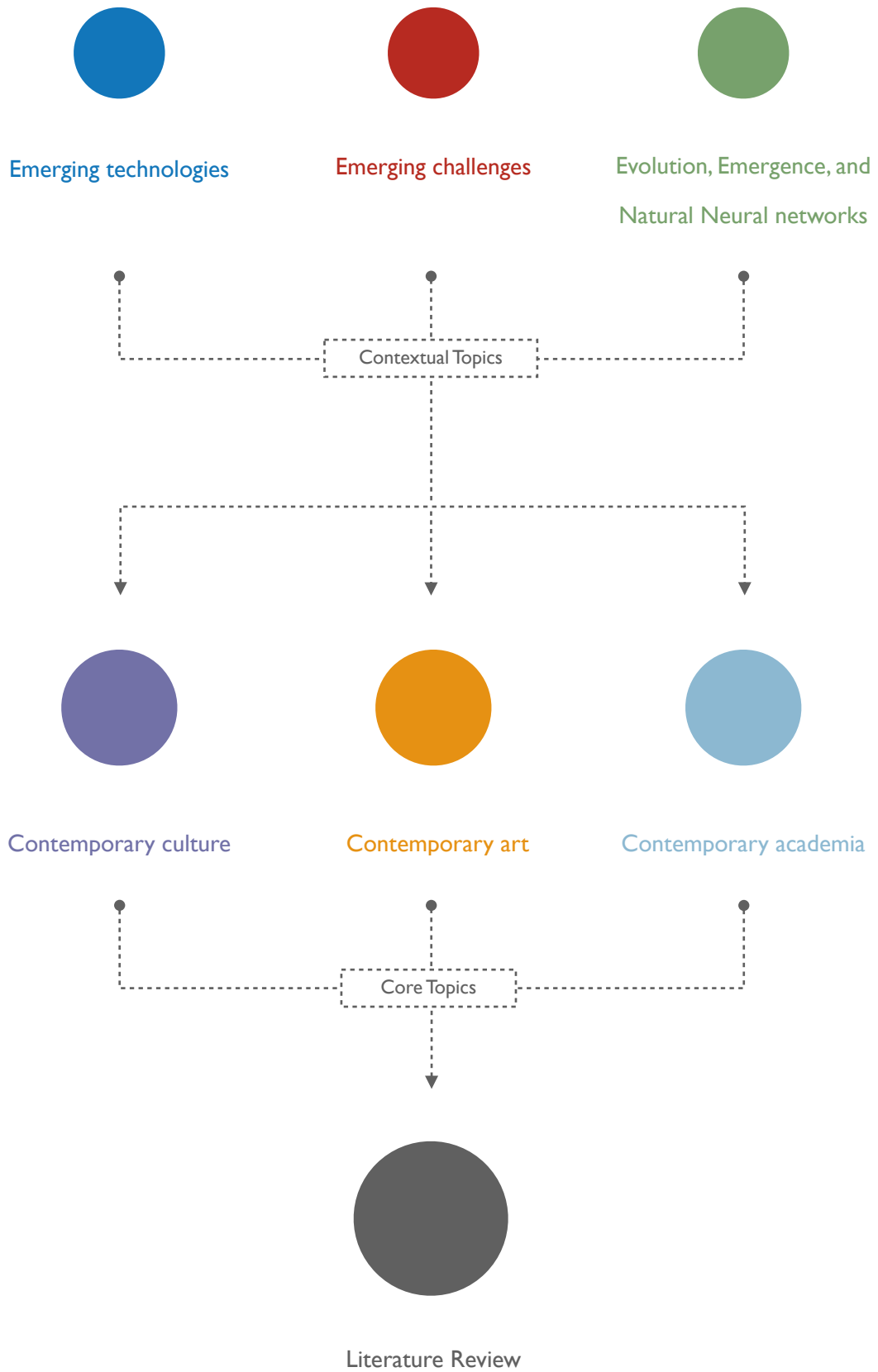
5.1 Emerging technologies

Emerging technologies encompass the most innovative and impactful technologies of a given time period. For example, computing and the internet were the most important emerging technologies of the late 20th century. In contrast, complex information networking systems, computing miniaturization, and wireless communication were the emerging technologies of the first two decades of the 21st century.

As of the start of the 2020s, the emerging technologies of our time are already clearly defined, and those aware of their nature can guess what positive or negative changes they could bring forth to our world. To satisfy the objectives of this study, I have identified said technologies by researching, cataloging, and analyzing various contemporary scientific papers that delve into the development of those potentially impactful new technologies that are expected to become widely utilized by the general populace in the next 5 to 25 years. In regards to the emerging technologies that are expected to be relevant to our time, they are as follows:

Quantum Computing

- The research and development of Quantum based computing systems. Probabilistic in nature and based on Quantum-Photon systems, these computers would be exponentially more powerful than conventional electronic computers.

Artificial Intelligence

- The research and development of Artificial Intelligence systems of different complexity capable of performing cognitive tasks.

New Communication and Networking Systems

- The research and development of new generation communication systems.

Applied General Automation

- The utilization of advanced Information, Artificial Intelligence, and Mechanical systems to Automate tasks and processes.

Augmented reality

- The research and development of Augmented Reality based User Interface Devices and environments capable of hybridizing the physical and digital worlds into a seamless experience.

Virtual Intelligence

- The research and development of Virtual Intelligence based interactive systems, with the goal of easing the use of complex information systems through their anthropomorphization.

The Internet of things

- The hybridization of multiple information, communication, and automation emerging technologies in a seemingness way.

Virtual Reality

- The research and development of advanced digital systems capable of simulating complex and fully immersive virtual environments.

Genetic Engineering

- The modification of the genetic material found in living organisms through the use of novel techniques.

Bionic and Cybernetic Engineering

- The development and integration of advanced bionic and cybernetic devices into living organisms.

Intelligence Augmentation

- The utilization of Genetic Engineering and Cybernetic technologies to enhance the cognitive capabilities of living organisms.

Nanoengineering

- The research and development of engineering systems and tools on the nanoscopic scale.

New generation Materials

- The research and development of new generation meta-materials of various uses.

Giga Engineering

- The research and development of new generation large-scale engineering and construction.

New Power Generation and Transmission Systems

- The research and development of new energy regeneration and distribution systems.

Geo-Engineering

- The research and development of novel large-scale environmental engineering techniques capable of significantly modifying the natural world.

New Generation Aerospace Engineering

- The research and development of new generation aerospace technologies.

5.1.1 Which ones are the Key Papers, Authors, and Works?

Each of these emerging technologies is an extensive research topic addressed by hundreds of research institutions worldwide. Thus this dissertation can only afford to pinpoint some of the most relevant and recent studies made in those fields. It is also important to note that this dissertation focuses more on the socio-economic impacts of these technologies than on their finer technical details.

5.1.1.1 Quantum Computing

Researchers

- Most public and private institutions with access to advanced computing technologies. This study focuses on studies conducted by IBM, Google, and other independent researchers.

Relevant papers and works

- The research conducted by *Google's Ai campus* is dedicated to the development of Quantum computers, which plans to build a usable Quantum computer by 2029 (Lucero, 2021).

- *IBM's* project to create a 1000 Qbit quantum computer by 2023 (Cho, 2021).

- The analysis made on the importance and scalability of Quantum computing written by *Vincent-Philippe Lauzon*, titled *Quantum Computing - How does it scale?* (Lauzon, 2021).

5.1.1.2 Artificial Intelligence

Researchers

- Most public and private institutions with access to advanced computing technologies. This study focuses on studies conducted by independent researchers like the *Ai Multiple Group*, and that made by private enterprises the *OpenAi Group*, a research organization owned by Google.

Relevant papers and works

- The many initiatives and studies conducted by the *Open Ai Group* alongside Google (Open Ai Group, 2021).

- The extensive research conducted by the *Ai Multiple Group* on the topic of Artificial Intelligence, in regards to its nature, usability, and dangers, titled *Artificial Intelligence (AI): In-depth Guide [2021 update]* (Dilmegani, 2021).

- The analysis made by *Prakriteswar Santikary* about the nature and possible forms of Artificial Intelligence,

titled *Artificial Intelligence and Machine Learning: Part 1 — Definitions, Similarities and Differences* (Santikary, 2019).

- The analysis made by *O. Strelkova and O. Pasichnyk* about the three main types of artificial intelligence, titled *Three Types Of Artificial Intelligence* (Strelkova and Pasichnyk, 2017).

- The studies conducted by *John Von Newman* in regards to the concept of Ai and cataloged by Murray Shanahan in the article, titled *The Technological Singularity* (Shanahan, 2015, p. 233)

- The analysis made by *Vernor Vinge* about the nature and potential emergence of a technological singularity, titled *The Coming Technological Singularity: How to Survive in the Post-Human Era* (Vinge, 1993).

- The analysis made by *Ray Kurzweil* in regards to the potential emergence of a technological singularity, titled *The Singularity Is Near* (Kurzweil, 2005).

- The analysis made by *Neil Savage* in regards to the emerging Ai technological race titled *The race to the top among the world's leaders in artificial intelligence* (Savage, 2020).

- The article published by *Jun Wu* in regards to the nature of Ai empathy, titled *Empathy in Artificial Intelligence* (Wu, 2019).

5.1.1.3 New Communication and Networking Systems

Researchers

- Public and private institutions with interests in the development and construction of new generation communication systems. This study focuses on third-party studies conducted by the *Thales Group, the Digital Trends Group,* and the *BBC*.

Relevant papers and works

- The extensive research conducted on the development, nature, usability, and dangers of 5G and 6G wireless communication networks conducted by the *Thales Group,* titled *5G vs 4G: what's the difference?* (Thales Group, 2020).

- The research conducted by the *Digital Trends Group* on the probable developmental timeframe of 5G and 6G wireless communication technologies, titled *What is 6G, how fast will it be, and when is it coming?* (Boxall and Lacoma, 2021).

- The analysis report by *the BBC* on the possible health risks deviated from the utilization of 5G and 6G networks, titled *Does 5G pose health risks?* (Reality Check team, 2019).

- The article published by *the 101 Blockchains* in regards to the new forms of internet connections, titled *Centralized vs. Decentralized: What Are the Core Differences?* (101 Blockchains, 2021).

- The study conducted by *Javad Zarrin* and his team in regards to Web 3.0 and internet decentralization, titled *Blockchain for decentralization of internet: prospects, trends, and challenges* (Zarrin et al, 2021).

- The IPFS presentational webpage, titled *The web of tomorrow needs IPFS today* (IPFS, 2021).

- The article published by *Nicholas Weaver* in regards to the fraudulent nature of cryptocurrencies and Web 3.0, titled *The Web3 Fraud* (Weaver, 2021).

5.1.1.4 Applied General Automation

Researchers

- As a subset of Artificial Intelligence, Automation technologies are mostly developed by the same research groups or derivate ones. This dissertation gives special importance to the studies conducted by independent research groups on the possible impacts of automation.

Relevant papers and works

- The extensive research conducted on the nature, usability, and possible socioeconomic consequences of Applied General Automation by *Mark Muro, Robert Maxim,* and *Jacob Whiton* of the *Brookings Group,* titled *Automation and Artificial Intelligence: How machines are affecting people and places* (Muro, Maxim, and Whiton, 2019).

- The research conducted by the *Granta Group* on the positive and negative aspects of Applied General Automation, titled Advantages and Disadvantages of Automation (Granta, 2017).

- The work conducted by the *Nigel Wrights Group* on the probable evolution and impact of automation technologies, titled *Automation and its impact on employment* (Nigel Wright Group, 2018).

- The index created by the *Economist Intelligence Unit* on the expected readiness of countries in the face of the proliferation of Applied General Automation, titled *The Automation Readiness Index* (The Economist Intelligence Unit 2018).

- The research conducted by *Frey, C.B.* and *Osborn M.A.* on the susceptibility of work-related tasks to automation, titled *The Future of employment: How susceptible are jobs to computerization?* (Frey and Osborn, 2017, p. 254-280).

- The analysis conducted by *the Price-water Group* on the possible impact of automation on the Job Market, titled *How will automation impact jobs?* (Price-water House Coopers, 2017).

5.1.1.5 Augmented reality

Researchers

- As augmented reality is a composite computing and information technology, The development in this field is led by computing and information system manufacturers like Apple, Microsoft, Google, and Tencent. This dissertation focuses on the analysis conducted in the field by independent researchers.

Relevant papers and works

- The research conducted by the *ThreeKit Group* on the nature of Augmented Reality, titled *Augmented Reality Statistics You Should Know in 2021* (ThreeKit, 2020).

- The article published by *Bernard Marr* on the topic of Virtual and Augmented Reality, titled F*uture*

Predictions Of How Virtual Reality And Augmented Reality Will Reshape Our Lives (Marr, 2021).

- The article published by *Yitzi Weiner* in regards to the possible impacts of augmented reality, titled 39 Ways AR Can Change The World In The Next Five Years (Marr, 2021).

5.1.1.6 Virtual Intelligence

Researchers

- As a subset of Artificial Intelligence, Virtual Intelligence technologies are mostly developed by similar research groups or derivate ones. This dissertation gives special importance to the studies conducted by independent research groups on the possible uses of Virtual Intelligence.

Relevant papers and works

- The research conducted by *Terence Mills* of the *Forbes Group* on the nature and possible uses of Virtual Intelligence, tilted *Virtual Intelligence Vs. Artificial Intelligence: What's The Difference?* (Mills, 2018).

5.1.1.7 The Internet of things

Researchers

- As a composite emerging technology born from the combination of multiple other information and computing emerging technologies, the Internet Of Things is researched by similar research groups, which include corporations like Apple, Google, and Tencent, as well as smart logistics providers like Amazon.

Relevant papers and works

- The papers relevant to this field are those previously mentioned that are relevant to the fields of computing, information, communication, and logistic technologies.

5.1.1.8 Virtual Reality

Researchers

- As Virtual Reality is a computing and interfacing technology with multiple potential interdisciplinary uses, its development is led by computing research companies, software developers, and digital entertainment providers. Until recently, VR development has mostly been the domain of three specific companies, those being Sony, Oculus (as a Subsidiary of Facebook), and HTC.

Relevant papers and works

- The research on Virtual reality published by *Pietro Cipresso, Irene Alice Chicchi Giglioli, Mariano Alcañiz Raya and Giuseppe Riva*, titled *The Past, Present, and Future of Virtual and Augmented Reality Research: A Network and Cluster Analysis of the Literature* (Cipresso et al, 2021).

- The article published in *Forbes* written by *Bernard Marr* on the topic of Virtual Reality, titled F*uture Predictions Of How Virtual Reality And Augmented Reality Will Reshape Our Lives* (Marr, 2021).

- The article published on LinkedIn by *Aviram Eisenberg* about the topic of fully immersive virtual reality, titled *Full Dive Virtual Reality — Coming Soon to a Brain Near You* (Eisenberg, 2018).

- The article published in *Investopedia* by *Jean Folger* about the nature of the Metaverse, titled *Metaverse* (Folgen, 2021)

- The research on the potential negative psychological consequences of Virtual reality published by *Raymond Lavoie, Kelley Main, Corey King,* and *Danielle King*, titled *Virtual experience, real consequences: the potential negative emotional consequences of virtual reality gameplay* (Lavoie et al, 2021).

5.1.1.9 Genetic Engineering

Researchers

- The research of new generation Genetic Engineering technologies is led by multiple public and private research firms. This dissertation focuses on third-party studies conducted on the viability, potential, and controversy posed by the new generation of genetic engineering technologies.

Relevant papers and works

- The research published in the *New Engineering* magazine by *James Matthew Alston* in regards to the nature and potential of genetic engineering, titled *The future of genetic engineering* (Alston, 2020).

- The article published in *Parsley Health* by *Robin Berzin* on the subject of utilizing genetic engineering to slow down and potentially reverse the aging process, titled *Want to Slow Down Aging? Meet Your Telomeres* (Berzin, 2020).

- The article published in the *Atlas Blog* by *Shu En Lee* on the subject of aging reversal technologies, titled

The Facts On The Reverse Aging Process And Reversing Age (Lee, 2021).

- The article published in The *New Statesman* by *Jenny Kleeman* on the subject of senolytic research companies, titled *Who wants to live forever? Big Tech and the quest for eternal youth* (Kleeman, 2021).

5.1.1.10 Bionic and Cybernetic Engineering

Researchers

- Bionic and cybernetic research is led by multiple private and public firms, although this dissertation focuses more on third-party studies conducted on the viability and potential of bionic and cybernetic technologies.

Relevant papers and works

- The research conducted by *Yingxu Wang's* research group in regards to the viability of human-machine mind hybridization, published by the *IEEE*, and titled *Cybernetics, Humanity, and Systems Science Toward Autonomous Artificial Intelligence* (Wang et al, 2020).

- The article published in the *FreeThink* magazine by *Teresa Carey* in regards to the topic of bionic and cybernetic augmentation, titled *Run faster, think better: Hugh Herr on the future of bionics* (Carey, 2020).

5.1.1.11 Intelligence Augmentation

Researchers

- As a subset of Cybernetic and Genetic engineering, the development of this technology is led by similar private and public firms and institutions.

Relevant papers and works

- The article published in *The Singularity Hub* by *Edd Gent* in regards to the viability of augmenting the intelligence of animal species through the use of cybernetic and genetic engineering technologies, titled *If We Could Engineer Animals to Be as Smart as Humans—Should We?* (Valanides, 2019).

- The article published in *KPMG* by *Constantinos Valanides* in regards to the viability and potential uses of intelligence augmentation technologies, titled *Intelligence Augmentation: The evolution and the future of Artificial Intelligence* (Valanides, 2019).

5.1.1.12 Nanoengineering

Researchers

- Nanotechnology research is led by Chinese and North American researchers, while other important research groups exist all around the world. This study focuses on third-party studies and articles conducted on the topic of nanotechnology.

Relevant papers and works

- The study conducted by *Dr. Takahiro Namazu* of the *Kyoto University of Advanced Science*, in regards to the potential and probable future of Nano

Technologies, titled *Nanoengineering Will Change the Future and How We Think* (Namazu, 2020).

- The study published by *Vincent Mangematin and Steve Walsh* on *Science Direct*, titled *The future of nanotechnologies* (Mangematin and Walsh, 2020).

5.1.1.13 New Generation Materials

Researchers

- The research on new generation materials is led by multiple engineering research firms around the world. This dissertation focuses on third-party studies that offer a broad analysis of the topic.

Relevant papers and works

- The article published in Forbes by Ethan Siegel in regards to the research on room temperature superconductor materials, titled How Close Are We To The Holy Grail Of Room-Temperature Superconductors? (Siegel, 2021).

- The study published by *J. Markoff* of *The New York Times*, titled *These Materials Could Make Science Fiction a Reality* (Markoff, 2021).

- The study published by the *Wisconsin Metal Tech team*, titled *9 Amazing Future Materials | #9 is REALLY scary* (WMT Team, 2019).

5.1.1.14 New Generation Transportation Systems

Researchers

- New generation transportation systems are mostly being developed by private enterprises. This

dissertation focuses on third-party studies that offer a broad analysis of the topic.

Relevant papers and works

- The article published in the *Future Proof Blog* by *Shiori Ota, Marianna Mäki-Teeri, and Max Stucki* about the future of transportation, titled *12 Trends That Will Drive the Future of Transport* (Ota, Mäki-Teeri and Stucki, 2020).

- The study published by *Sam Mire* of the *Disruptor Magazine*, titled *What's The Future Of Transportation? 16 Experts Share Their Insights* (Mire, 2019).

5.1.1.15 New Power Generation and Transmission Systems

Researchers

- As an extensive field composed of many different subjects, this dissertation focuses on the research of novel and upgraded forms of renewable energy generation systems led by European laboratories, as well as on the research conducted by *ITER* in regard to the creation of fusion power systems.

Relevant papers and works

- The article published in the *Power Magazine* by *Thomas Overton* in regards to the development of fusion power technologies, titled *Fusion Energy Is Coming, and Maybe Sooner Than You Think* (Overton, 2020).

- The article published in *Earth.Org* by *Emily Folk* in regards to the future of renewable energy generation, titled *What the Future of Renewable Energy Looks Like* (Folk, 2021).

5.1.1.16 Geo-Engineering

Researchers

- Research on GeoEngineering is being conducted by most developed countries through both public and private initiatives. This study focuses on third-party studies and articles conducted on the topic of GeoEngineering.

Relevant papers and works

- The study published by *Fred Pearce* of the *Yale School of the Environment's* magazine, titled *Geoengineer the Planet? More Scientists Now Say It Must Be an Option* (Pearce, 2021).

5.1.1.17 New Generation Aerospace Engineering

Researchers

- While national aerospace organizations like NASA, ESA, Roscosmos, and CASC still lead the field, it is undeniable that in this last decade private aerospace organizations like SpaceX Blue Origin and Virgin Galactic have become almost as relevant as their governmental counterparts, and that as the century advances said relevance will only increase. This dissertation focuses on third-party studies that explore the initiatives undertaken by all these organizations.

Relevant papers and works

- The article published by *Stuart Clark* of the *Science Focus* magazine, titled *ESA and NASA unveil bold plans for the future of space exploration* (Clark, 2020).

- The report on the near future of aerospace
  exploration, published by *KPMG*, titled *30 Voices on
  2030: The Future of Space* (Kalms et al, 2020).

- The webpage published by *NASA* about the Artemis Moon
  missions, titled *Artemis* (NASA, 2022).

5.1.2 Which ones are the key theories and hypotheses?

5.1.2.1 Quantum Computing

Development

- Quantum Computing research has advanced steadily in
  the last decade, with Google unveiling a 53 Qbit
  Quantum computer in 2019 (comparable to a 1 ExaByte
  conventional computer), and IBM unveiling a 65 Qbit
  one in 2020 (with a memory capacity of $3.6*10^{19}$ bits).
  It is expected that, by the midpoint of this decade,
  researchers will be able to create Quantum Computers
  in the 1000 Qbit range (having a bit capacity of
  $1.1*10^{301}$, and a Ram capacity of $1.3*10^{282}$ ExaBytes)
  (Lauzon, 2021). We can expect to have usable quantum
  computers by the midpoint of the 2030s (Lauzon, 2021).

- The sheer computing capacity and probabilistic nature
  of Quantum Computers make them ideal for the
  development of advanced forms of artificial
  intelligence. Still, that same probabilistic nature
  limits their use for general computing, as most of
  our everyday information and computing systems are
  designed to work deterministically. This problem is
  expected to be solved sometime in the coming decades
  (Dilmegani, 2021).

Uses and possible impacts

- Quantum Computers will drastically increase the computing capacity we have access to (Lauzon, 2021).

- Essential for the development of complex forms of Artificial Intelligence like AGI and ASI (Lucero, 2021).

5.1.2.2 Artificial Intelligence

Development

- Ai research has already advanced to a point in which we can already create ANI (Artificial Narrow Intelligence) and VI (Virtual Intelligence) systems for general use (Strelkova and Pasichnyk, 2017).

- Due to the highly experimental nature of AI, it is exceedingly hard to determine when we will be able to create fully functional AGIs (Artificial General Intelligence). Still, it is generally considered that if most major roadblocks are solved, and if Quantum Computing research continues forward uninterrupted, we might be able to create them at some point in the 2050s or 2060s (Dilmegani, 2021).

- The development of the most complex forms of AI, known as ASI (Artificial Super Intelligence), is even harder to predict, with some researchers pointing out that they might come to be on their own as soon as we create AGIs. In contrast, others say that we will likely be unable to create them at all (Dilmegani, 2021).

Uses and possible impacts

- Essential for the development of many other emerging technologies, like Automation. It has the potential to enhance the productive and cognitive capacities of our civilization radically, but it is burdened with multiple ethical concerns regarding the creation and utilization of Synthetic Intelligent Life (Dilmegani, 2021).

- A new arms race is forming regarding the development of artificial intelligence, not until the one that the development of atomic technologies caused in the 20th century (Dilmegani, 2021).

- It is extremely hard to program Artificial intelligences doted with authentic emotions and empathy, which causes an alarming amount of researchers to forego these aspects in favor of developing purely rational artificial minds (Santikary, 2019).

- There is no way to predict how the more complex forms of Ai could behave or evolve, which could potentially have catastrophic consequences (Open Ai Group, 2021).

5.1.2.3 New Communication and Networking Systems

Development

- The construction and utilization of 5G wireless networks (which are 100 times more potent than 4G networks and can handle up to 1 million simultaneous devices per square kilometer in real-time without any noticeable lag) are already underway. In contrast, the more advanced 6G networks (expected to be 1000 times more powerful than 5G networks) are

expected to enter active service in 10 years
(Digital Trends, 2021).

- Regarding information and data networking, the most
prominent emerging technologies in the sector are the
non-Blockchain-based hybrid protocols like IPFS, as
Blockchain-based technologies are proving to be
unreliable and easily exploitable (Weaver, 2021).

- In general terms, many experts argue that the current
centralized Web system is obsolete and that creating a
less centralized Web is critical. Still, there is much
debate regarding what protocols or structures should
be used in that endeavor (101 Blockchains, 2021).

- Those who defend the Blockchain and Cryptocurrency
based system present it as an effective way to create
a decentralized web where personal privacy and data
resilience are at the forefront of its conception.
However, those who criticize this system point out
its extreme inefficiency, carbon footprint, and
fraudulent nature (Zarrin et al, 2021).

- The detractors reiterate that these systems have no
meaning or real use, arguing that all they can
provide can be accomplished more efficiently by
utilizing other protocols (Weaver, 2021).

- The IPFS protocol is one of the best examples of a
new generation networking protocol that can be used
to create a decentralized and secure network system
without utilizing inefficient Blockchain systems or
fraudulent cryptocurrencies. This protocol, and other
protocols similar to it, could eventually become one
of the defining protocols of the new generation of
the web (IPFS, 2021).

Uses and possible impacts

- Essential for the construction of complex automated systems on an urban scale or larger (Thales Group, 2020).

- Essential for the utilization of more advanced computing and multimedia systems due to their increased memory utilization (Thales Group, 2020).

- Health concerns exist in regards to the prolonged use of 5G or 6G networks, as their higher wave frequency (when compared to 4G networks) could potentially damage the genetic material of human bodies (Reality Check team, 2019).

- Many argue that the decentralization of the internet will be vital to guaranteeing its long-term resilience and survival in the face of unexpected events and that failing to do so would severely compromise its long mid to long-term integrity (101 Blockchains, 2021).

- However, this belief, and a desire for personal profit, drive many individuals to embrace Blockchain and Cryptocurrency based technologies. This trend has caused a very severe and largely fraudulent speculative bubble that has harmful consequences for the natural environment and the computing industry. While it is expected that this bubble will eventually blow, international regulation could cut the problem short before its impact causes more significant long-term damage (IPFS, 2021).

5.1.2.4 Applied General Automation

Development

- As of 2021, the usage of automation technologies is already widespread in developed countries, if limited to the automation of basic logistic and administrative tasks (Nigel Wright Group, 2018).

- In general terms, experts consider that the applicability and usage of automation technologies will increase as the century progresses and more advanced forms of Artificial Intelligence are developed (Nigel Wright Group, 2018). More straightforward tasks, like manufacturing, logistic, or administrative-related ones, will be automated first, while more complex tasks will require more complex forms of Ai to be automated (Frey and Osborn, 2017, p. 254-280).

- Some experts consider that we will eventually be able to automate most of the tasks that make up contemporary professions.

Uses and possible impacts

- Automation technologies have the potential to radically enhance the productive capacity and efficiency of most human disciplines (The Economist Intelligence Unit 2018).

- Automation technologies will more than likely cause large amounts of unemployment as their use becomes more widespread. Some experts think that the new professions automation will create by itself will offset this change. In contrast, others believe that significant socio-economic reforms will be necessary to avoid what could be the highest rise in unemployment in recent history (Muro, Maxim and Whiton, 2019).

5.1.2.5 Augmented reality

Development

- As of 2021, Augmented Reality is already being utilized to a relevant degree. More refined forms of this technology are expected to enter general consumer use by the midpoint of this decade. Widespread use of the technology will likely follow soon after that, as the infrastructure required to make it relevant, mainly the new generation wireless information and communication systems, are completed. By the end of the decade, it is expected that augmented reality devices will have largely replaced modern smartphone devices (ThreeKit, 2020).

Uses and possible impacts

- It will make using advanced forms of automation and information networks a seamless and ergonomic experience (ThreeKit, 2020).

- Could redefine how we perceive and interact with the world (ThreeKit, 2020).

- We can not predict what sociological and phycological impacts it could have on the general population (ThreeKit, 2020).

5.1.2.6 Virtual Intelligence

Development

- Simpler forms of Vis already exist in the form of digital assistants. The research on Narrow Artificial Intelligence will largely determine the development of more complex forms of Vi. Vis will become more widespread in the following decades (Mills, 2018).

Uses and possible impacts

- A technology essential for homogenizing the newer
  forms of information, communication, and automation
  systems, as Vis will work as intermediaries between
  the human user and the systems they are utilizing
  (Mills, 2018).

5.1.2.7 The Internet of things

Development

- The development and implementation of The Internet of
  Things will be largely determined by the development
  of all of its prerequisite technologies.
  Consequently, the IoT is expected to become a reality
  progressively, with it becoming relevant no sooner
  than by the start of the next decade (Ranger, 2020).

Uses and possible impacts

- As a combination of multiple information,
  communication computing, and automation emerging
  technologies, the IoT is expected to serve as a way
  to enhance the capabilities of said technologies in a
  synergic way (Ranger, 2020).

- The IoT could cause an unprecedented redefinition of
  everyday life, as it would combine the physical world
  we have always lived on with the digital realm into a
  single seamless reality. We can only guess the
  sociological and physiological effects this might
  cause (Ranger, 2020).

- In regards to the short-term future, we can expect
  that Virtual and Augmented Reality technologies will
  be utilized alongside IoT technologies by media and
  information companies and organizations to give shape

75

to a composite reality called the *Meta Verse,* an
evolution of the contemporary internet (Folgen, 2021).

5.1.2.8 Virtual Reality

Development

- As of 2021, virtual reality development has advanced
  enough to become a significantly utilized, if still
  niche, technology. In the coming decades, more
  advanced and immersive VR devices are expected to be
  developed, allowing for more widespread use of the
  technology. Eventually, as cybernetic technologies
  evolve further, we could potentially create VR
  interfaces capable o feeding the virtual experiences
  directly into our brains, allowing us to give shape
  to fully immersive virtual worlds indistinguishable
  from reality (Cipresso et al, 2021), (Marr, 2021),
  (Eisenberg, 2018), (Lavoie et al, 2021).

Uses and possible impacts

- Virtual reality is expected to become an essential
  technology for the future of the digital and
  information industry in the coming decades, both as a
  general use utility tool and as an entertainment
  system. This is a development that will happen
  alongside the evolution of Augmented reality
  technologies, converging with those new systems at
  some points to give shape to Mixed Reality Interfaces
  (utilities that combine both Augmented and Virtual
  Reality technologies) (Marr, 2021).

- The potential creative applications of Virtual Reality
  devices are only starting to become apparent. While
  modern VR tools are already useful as creative tools,
  one can only imagine that once mow complex and

immersive forms of the technology become accessible to the general public, the artistic disciplines will embrace their use. Eventually, the potential to give shape and experience fully immersive virtual worlds that are indistinguishable from reality will undoubtedly give birth to a new and revolutionary artistic field, that of the reality makers (Eisenberg, 2018), (Lavoie et al, 2021), (Concina, 2021).

5.1.2.9 Genetic Engineering

Development

- As of 2021, the field of Genetic Engineering is currently at a crossroads. New gene editing techniques are discovered regularly, many of which, if refined, could revolutionize medical treatments and open up new ways to extend life expectancy and quality. Ultimately, however, the main challenge this field is facing is an ethical one, primarily because while we can simply not foresee what negative consequences these new technics could potentially have if we do not refine them, their unquestionable utility, summed to their relative ease of use and lack of concrete international legislation could possibly lead to a new type of extremely dangerous arms and commercial race (NAS, 2016, p. 353), (Alston, 2020), (Berzin, 2020), (Lee, 2021).

- The senolytic engineering field is gaining more momentum as of the start of the 2020s, with the first anti-aging treatments expected to enter the general markets by the end of the decade (Kleeman, 2021).

Uses and possible impacts

- The potential uses of new generation Genetic Engineering could revolutionize our lives. In regards to their medical applications, these new techniques will more than likely be utilized to treat and cure rare genetical diseases in the short term. In some decades, as gene modifying tools are enhanced and reined further, the treatment and reversal of aging could become possible, with all the positive and disruptive consequences that could have (NAS, 2016, p. 353).

- Considering that these new tools could be used to proactively modify the genetic material of living beings, it is easy to imagine what marvelous, if terrifying, applications they could have. From enhancing and recombining the physical and cognitive capacities of every known species, including ourselves, to the creation of entirely new forms of life tailored to specific proposes, we could potentially mold the natural world and ourselves to our liking, for better or worse (Alston, 2020).

- Senolytic treatments can potentially halt, cure, and even reverse the aging process. With the first treatments of this kind expected to enter general use by the end of the 2020s, we can only start to imagine how a world without human aging could be. The potential ethical and philosophical implications brought forth by such a change can only be comparable to the economic and demographic challenges these treatments could unfold if society doesn't prepare itself for their arrival. If the use of these treatments is generalized, they could lead to a population explosion that could cause the collapse of our civilization. Still, if these treatments end only

in the hands of a few select individuals, society
could also collapse as a consequence of the rest of
humanity uprising against those individuals in the
context of the crossroads (Berzin, 2020).

- Redefining our cultural and economic models to
account for a significantly longer human life span
and health span will be vital in overcoming the
crossroads.

5.1.2.10 Bionic and Cybernetic Engineering

Development

- Much like Genetic Engineering, Bionic and Cybernetic
engineering is currently at a point where its
practical use for the short-term future will be
largely confined to the realm of medicine, in this
case serving as an optimal way to treat paints which
have suffered the loss of a body part. By the
midpoint of the century, however, we can expect that
bionics and cybernetics will have become advanced and
streamlined enough to find their way into the
commercial markets both as vanity and body-enhancing
items (Wang et al, 2020), (Carey, 2020).

Uses and possible impacts

- The potential medical applications of advanced bionic
and cybernetic implants are undeniable, as they could
be used to restore the life quality of those who have
lost a limb or an organ (Wang et al, 2020).

- Eventually, bionics and cybernetic will become
sophisticated enough to permit the repair and
enhancement of the human body. Much like genetic
engineering, this possible application is a double-

edged sword, mainly because it would cause a
significant social schism between those who could
afford these implants and those who couldn't (Carey,
2020).

- Ultimately, however, the most significant value
advanced bionic cybernetics offer as a technology is
the potential to integrate biological beings and
minds with machine and information systems, opening
many new venues for human-machine interactions (Wang
et al, 2020).

5.1.2.11 Intelligence Augmentation

Development

- This topic should be understood as a specific
application of Genetic and Cybernetic Engineering;
thus, its expected development is contained within
those same topics.

Uses and possible impacts

- In regards to the following decades, Intelligence
augmentation technologies could be utilized to
normalize the cognitive capacities of those who have
either been born with dangerous neuro-divergent
conditions or to restore the minds of those who have
suffered neurological impairment as a consequence of
an accident or illness (Alston, 2020).

- Eventually, more advanced and refined forms of those
technologies could be utilized to expand the
cognitive capacities of living beings, whether these
are humans or animals. This could potentially lead
to the uplifting of animal species and to the

creation of super-intelligent humans (Gent, 2018),
(Valanides, 2019).

5.1.2.12 Nanoengineering

Development

- Nanoengineering is already becoming a cornerstone for
  developing emergent medical, computing, and general
  engineering technologies. As the century progresses,
  we can only expect its complexity, usability, and
  influence to increase even further, becoming the
  baseline on which the world of tomorrow will be built
  (Namazu, 2020).

Uses and possible impacts

- Nanoengineering's main usefulness is the capability
  of engineering the world at the nanoscopic scale.
  Much like Microscopic Engineering revolutionized its
  time, we can only expect that nano-Engineering will
  do the same for ours, but more than likely in a more
  significant way (Namazu, 2020).

- It would be appropriate to think about nanotechnology
  as a toolkit rather than a concrete technology. It
  will eventually be applied to the most directly
  practical human disciplines, from general engineering
  and construction to computing engineering and
  medicine. It will allow us to enhance what we can do
  in those fields to unprecedented levels (LIYSF, 2021).

5.1.2.13 New Generation Materials

Development

- New Generation materials are created regularly, mostly as evolutions or refinements of previously known materials. In the next decades, we can expect many new carbon-based meta-materials to complete their development cycle and enter general use (Siegel, 2021), (Markoff, 2021), (WMT Team, 2019).

Uses and possible impacts

- Short term, the arrival of a new generation of diverse carbon-based materials and metallic-based meta-materials will significantly enhance the general engineering, power generation and transmission, scientific research, construction, computing, and medical disciplines (WMT Team, 2019).

- An eventual discovery of a superconducting material capable of functioning at room temperature and pressure would positively impact most practical disciplines in one way or another. Still, it would revolutionize the power generation and transportation industries (Siegel, 2021).

5.1.2.14 New Generation Transportation Systems

Development

- If the development of the requisite technologies continues at a steady pace, we will start to see the generalized rollout of autonomous electric vehicles and high-speed vacuum transportation systems by the end of this decade (Ota, Mäki-Teeri and Stucki, 2020), (Mire, 2019).

Uses and possible impacts

- In regards to the immediate future, we can expect that autonomous vehicles will revolutionize personal transportation in most environments by the end of this decade, increasing the efficiency of logistic routes very significantly but causing the massive displacement of transportation professionals in the process. By that point, most small-scale vehicles are expected to be electric and of public or corporate ownership, which could significantly decrease the environmental impact of everyday vehicle use (Ota, Mäki-Teeri, and Stucki, 2020).

- By the start of the next decade, it is expected that small-scale autonomous vehicles and drone delivery systems will have started to replace traditional car-based transportation in urban areas. This will eventually lead to an almost complete departure from automobile-based transportation in urban areas (Ota, Mäki-Teeri, and Stucki, 2020).

- The eventual large-scale construction of long-range magnetic vacuum tube supersonic transportation systems could revolutionize long-distance transportation, significantly reducing travel times between distant cities (Mire, 2019).

5.1.2.15 New Power Generation and Transmission Systems

Development

- The development of newer forms of renewable energy generation, such as Fusion Power, and that of more advanced forms of energy transmission, largely depends on the development conducted on new generation materials and the aerospace industry. In

any case, it is expected that more advanced forms of
contemporary renewable energy generation technologies
will be introduced to general use in little more than
a decade (Overton, 2020), (Folk, 2021).

Uses and possible impacts

- More advanced, efficient, and cheaper forms of
  carbon-based batteries and small-scale renewable
  power generation systems will be introduced to the
  general consumer markets in the next few years. This
  will allow for renewable energy generation to become
  way more widespread in the foreseeable future,
  potentially causing the replacement of conventional
  power plants and infrastructure in favor of
  decentralized power grids (Folk, 2021).

- Many experts agree that we might be able to create
  commercially viable Fusion Power Plants by the
  midpoint of the century. However, for the full
  potential of this technology to be realized, we would
  require to mine and import Helium 4 from the dark side
  of the Moon, as only this element would allow us to
  create completely clean fusion reactions. The more
  easily accessible deuterium could be utilized in place
  of Helium 4. Still, those reactors would generate an
  amount of radioactive nuclear waste comparable to that
  of a fission reactor (Overton, 2020).

5.1.2.16 Geo-Engineering

Development

- As a largely new and experimental research field, it
  is not feasible to predict when and how this
  technology will unfold, apart from pointing out that
  experts seem to agree that it could become one of the
  cornerstones in the fight against climate and
  ecological destabilization though the rest of the
  century and beyond (Pearce, 2021).

Uses and possible impacts

- Geo-engineering could become an essential tool in the
  fight to restore the climate and biospheres of the
  Earth, as it would allow us to directly correct the
  negative consequences of pollution, global warming,
  and ecological degradation. However, it is essential
  to point out that due to the experimental nature of
  these technologies, it wouldn't be unreasonable to
  expect that their use could backfire (Pearce, 2021).

- Developing Geo-Engineering technologies today could
  be invaluable for the future of space colonization,
  as the same research could be repurposed to kickstart
  the development of more complex terraforming
  technologies (Pearce, 2021).

5.1.2.17 New Generation Aerospace Engineering

Development

- Aerospace engineering research and development is
  expected to accelerate significantly in the coming
  years, a consequence of the new space race that has

erupted between developed Western and Eastern nations, and between large-scale corporations with interest in developing new aerospace systems for a variety of reasons. All in all, this is a field that is expected to progress at a steady pace through the entire century. As a consequence, space is expected to become way more accessible for national and private interests alike (Clark, 2020), (Kalms et al, 2020).

Uses and possible impacts

- In regards to the next ten years, we will likely see many new space ventures unfold with the goal of consolidating the ease of access and stability of Earth's low orbit, alongside the realization of a series of missions to the Moon and the asteroid belt, to determine how we could utilize their resources. This will be made possible thanks to the introduction of novel and more efficient forms of reusable space launch systems. For the most part, this phase will be conducted by autonomous spacecraft, although some crewed missions will also be conducted. Space tourism will also be a defining aspect of this period (Clark, 2020), (Tangermann, 2021), (NASA, 2022).

- From 2030 to the midpoint of the century, we will likely see a drastic increase in the number and complexity of missions conducted in space. Through these two decades, it is expected that we will build our first permanent bases on the moon for scientific and industrial purposes. It is also expected that space mining and manufacturing industries will start to lay their foundations. A crewed mission to Mars is likely to happen at this point (Kalms et al, 2020).

- It is hard to determine how space exploration will
  unfold from this point onwards, as its development
  will largely depend on the research conducted on many
  other emerging technologies. However, we can
  determine that, even with conventional technology,
  space exploration and exploitation will continue to
  accelerate. When space resource extraction and
  manufacturing become self-sufficient endeavors, a new
  era of exploration and colonization will begin, as we
  will no longer be limited to launching space missions
  from our planet (Clark, 2020).

5.1.3 Which ones are the gaps my research is trying to fill?

5.1.3.1 Quantum Computing

Gaps

- As my research mainly studies Quantum Computing as a
  prerequisite technology for other emerging
  technologies, it does not attempt to fill any gaps
  regarding its development or use.

5.1.3.2 Artificial Intelligence

Gaps

- Regarding Artificial Intelligence, my thesis will
  explore the difficulty in programming emotions and
  empathy into synthetic minds and what consequences
  the creation of advanced Ai systems voided of these
  qualities could have. This will be done to explore
  how culture and art could help in the development of
  those aspects of synthetic minds.

- To achieve said goal, this research will focus both
  on the nature of Ai, and that of natural neural
  networks explained through the theory of intelligence
  evolution based on emergence and synergic
  relationships, ultimately trying to conceptualize a
  digital social network based on the structures and
  workings of both natural and synthetic minds that
  could help, among many other things, diminish the gap
  between the two groups.

5.1.3.3 New Communication and Networking Systems

Gaps

- As my research mainly studies the new wireless
  communication technologies as a prerequisite for
  other emerging technologies, it does not attempt to
  fill any gaps in regard to its development or use.

- In regards to the new decentralized internet
  protocols like the IPFS, I will utilize them as an
  aspect of the conceptualization of an emergent
  cultural network.

5.1.3.4 Applied General Automation

Gaps

- Most contemporary studies on the possible uses and
  socio-economic impacts of automation tend to tackle
  its cultural and artistic impacts in tangential ways.
  While this study will also provide a general overview
  of the topic of Applied General Automation, its focus
  will be to explore its possible relations with the
  cultural and artistic worlds.

- Ultimately, this study will attempt to explore and
  explain how automation could help create new cultural
  and artistic movements that not only help ease the
  possible negative impacts of large-scale automation
  on society but also manage to establish a synergic
  relationship with said technology to enhance it
  further.

5.1.3.5 Augmented Reality

Gaps

- As my research mainly studies Augmented Reality as a
  component of the Internet of Things, it does not attempt
  to fill any gaps regarding its development or use.

5.1.3.6 Virtual Intelligence

Development

Gaps

- As my research primarily studies Virtual Intelligence
  as a subset of Artificial Intelligence, it does not
  attempt to directly fill any gaps concerning its
  development or use.

5.1.3.7 The Internet of things

Gaps

- Contemporary studies and projects conducted on the
  topic of The Internet o Things tend to leave its
  possible cultural and artistic impacts in the hands
  of the service providers that are creating its
  working systems, and who are, for the most part, only

truly interested in redefining and enhancing how we
interact with reality in a way that gives them the
highest amount of revenue and information control
possible. Consequently, this study will explore those
possible consequences to a significant degree.

- This study will also attempt to devise ways in which
the IoT could be shaped and utilized in alternative
ways that establish a synergic relationship with
culture and art.

5.1.3.8 Virtual Reality

Gaps

- Regarding the technical aspects of Virtual Reality,
this study will not attempt to detect or fill any
gaps that concern its development.

- Regarding the practical uses of Virtual Reality, this
study will explore how artistic and cultural
disciplines could embrace it as a creative tool and
media platform in novel ways that are alternative to
mainstream media.

5.1.3.9 Genetic Engineering

Gaps

- Regarding the technical aspects of Genetic
Engineering, this study will not attempt to detect or
fill any gaps concerning its development.

- In regards to the practical uses and possible impacts
of Genetic Engineering, this study will explore how

culture and art could help us better adapt to the
changes and possibilities offered by it.

5.1.3.10 Bionic and Cybernetic Engineering

Gaps

- Regarding the technical aspects of Bionic and
  Cybernetic Engineering, this study will not attempt
  to detect or fill any gaps concerning its
  development.

- Regarding the practical uses and possible impacts of
  Bionic and Cybernetic Engineering Engineering, this
  study will attempt to explore how culture and art
  could help us better adapt to the changes and
  possibilities offered by them.

5.1.3.11 Intelligence Augmentation

Gaps

- Regarding the technical aspects of Bionic and
  Cybernetic Engineering, this study will not attempt
  to detect or fill any gaps concerning its
  development.

- In regards to the practical uses and possible impacts
  of Intelligence Augmentation, this study will attempt
  to explore how culture and art could help us better
  adapt to the changes and possibilities offered by it.
  However, it is essential to point out that due to the
  fundamental ways in which Intelligence Augmentation
  could change a person's mind and way of thinking, we
  can only theorize about what kind of culture or art
  they could create.

5.1.3.12 Nanoengineering

Gaps

- As my research mainly studies Nanotechnology as a perquisite and toolset for other emerging technologies, it does not attempt to directly fill any gaps regarding its development or use.

5.1.3.13 New Generation Materials

Gaps

- Most contemporary studies focus on the scientific and industrial applications of the New Generation Materials. Even if only tangentially, this study will explore how these materials could be utilized for artistic purposes.

5.1.3.14 New Generation Transportation Systems

Gaps

- Most studies conducted concerning the development of more advanced forms of transportation tend to oversimplify the impact these systems could have on culture. In consequence, this study will attempt to explore, at least to some degree, how those new transportation systems could influence culture.

5.1.3.15 New Power generation and transmission Systems

Gaps

- Even if only tangentially, this study will explore how more advanced forms of power generation and transmission could influence culture.

5.1.3.16 Geo-Engineering

Gaps

- Even if only tangentially, this study will explore
  how a generalized utilization of Geo-Engineering
  could influence culture.

5.1.3.17 New Generation Aerospace Engineering

Gaps

- Most studies conducted regarding the future of space
  exploration tend to oversimplify how culture could be
  impacted by it. Consequently, this study will attempt
  to explore, at least to some degree, how the new era
  of space exploration could influence culture.

5.2 Emerging challenges

Much like Contemporary Emerging technologies, Contemporary Emerging challenges are not defined by what they are in the present day but by what they could become in the short to mid-term. They are challenges of varying significance and nature that, while not that disruptive in the present day, could cause serious harm to our civilization and/or the natural environment if ignored for too long. Some of these challenges are evolutions of previous ones, while others are closely tied to other emergent factors and thus are entirely new. In any case, identifying, recognizing, and overcoming these challenges will be essential for the future of our species, a task that is easier said than done, as history has demonstrated time and time again that governments and influential private groups alike tend to ignore these sort of problems until it is too late to take proper action.

In this section, I'll detail the literature that I consider relevant to this topic and my thesis. Still, first I'll introduce the three main categories of emerging challenges my study will focus on:

General Emerging challenges

- This category includes natural and human-caused
  challenges that have already existed to a larger or
  smaller degree in the past but that only in recent
  times have become relevant enough for the general
  international community to take action against them.
  These challenges include but are not limited to
  Global Climate and Ecological Destabilization, New
  Generation Pandemics, Social, Economical and
  Political Inequality, Political destabilization, and
  Overpopulation.

Challenges posed by the new Emerging technologies

- This category focuses on exploring the challenges
  that could arise from the large-scale implementation
  of the New Emerging technologies. These challenges
  include, but are not limited to, mass unemployment
  caused by the large-scale implementation of
  Automation and Ai-based technologies, social
  inequality increase caused by a possible difficulty
  of access to new generation genetic and medical
  therapies, climate and ecological destabilization
  caused by an abuse of Geoengineering technologies,
  and the general security dangers posed by a rapid
  generalization of potentially dangerous emerging
  technologies.

Emerging Political Challenges

- This section is dedicated to the study of specific
  emerging political challenges. It mainly focuses on
  analyzing the expected evolution of national and
  international politics regarding the foreseeable
  future.

Emerging Economic Challenges

- Much like the section on politics, this section is dedicated to studying specific emerging economic challenges. To a great extent, this section is interconnected with the rest of the topics explored in this chapter of the literature review.

Emerging Cultural Challenges

- The category explores the emerging challenges associated with culture and the artistic disciplines. These challenges include but are not limited to a general decay of the diversity and value of culture caused by the prolonged proliferation of globalized culture, a general decline of the diversity and value of art generated by the prolonged and uncontested proliferation of artistic pluralism in the service of cultural globalization, a critical proliferation of apathy among the younger generations caused by the overexposure to corporate-based social networks and mass media, and the general degradation of the value of the academic disciplines caused by the proliferation of over-specialization in the face of the uncertainty of the future.

Black Swans

- This section is dedicated to exploring the concept and dangers posed by the Black Swan phenomena: the impacts of highly improbable events becoming a reality.

Emerging Natural Challenges

- This section is dedicated to exploring the emergence of natural challenges and their associated risks.

5.2.1 Which ones are the Key Papers, Authors, and Works?

Because of the complexity of each of these topics, this study has focused on exploring the work of those researchers that have studied Emerging challenges in a broad way that offers insightful information without being over-specific. In many cases, these studies do not only provide an overview of these challenges but also attempt to devise how they could be handled.

5.2.1.1 General Emerging challenges

Researchers

- While there are many studies conducted on the topic of the Emerging challenges of our time, this study will focus on the work done by the Millenium Project to categorize and study them, as it provides an extensive overview of the topic carried out by a multitude of international researchers that come from multiple disciplines.

Relevant papers and works

- The report published by *The Millenium Project Team* in regards to the evaluation of the Emerging challenges of our time and the future, titled *State of the Future 19.1* (Glenn, Florescu and The Millennium Project Team, 2018, p.n).

- The analysis made by *The Millenium Project Team* in regards to the Emerging challenges of our time, titled *15 Global Challenges* (The Millennium Project Team, 2021).

5.2.1.2 Challenges posed by the new Emerging technologies

Researchers

- For the most part, this topic is covered by the literature that focuses on the study of Emerging technologies themselves, although there are some articles specific to it that are interesting enough to warrant their own analysis.

Relevant papers and works

- The series of interviews conducted by *Bryan Lufkin* on the *BBC* with 50 experts from different scientific and technological fields in regards to the challenges of the future, titled *50 grand challenges for the 21st Century* (Lufkin, 2017).

- The report published by *Robert A. Manning* of the *Atlantic Council* in regards to the challenges that the new Emerging technologies could pose, titled *Emerging Technologies:New Challenges to Global Stability* (Manning, 2020).

5.2.1.3 Emerging Cultural Challenges

Researchers

- Culture and art are not only central topics to my research, but they are the foundation from which the rest of the research is conducted. This is why, for the most part, the literature that concerns these topics is contained, both directly and indirectly in the rest of the literature I have chosen. However, there are some studies specific to this topic that I would like to point out.

Relevant papers and works

- The study conducted by *Anheier Helmut* in regards to
  the rising issues related to personal identity,
  values, and culture, titled *Cultures, Values, and
  Identities: What Are the Issues?* (Anheier, 2020).

- The book published by *Kaitlin Ugolik Phillips*, titled
  *The Future of Feeling: Building Empathy in a Tech-
  Obsessed World* (Phillips, 2020, p.n).

- The article published in *Forbes* by *Evan Gerstmann*,
  titled *Cancel Culture Is Only Getting Worse*
  (Gerstmann, 2020).

- The study conducted by *Swati Aggarwal and his team* in
  regards to the biased nature of contemporary mass
  media news networks, titled *Media bias detection and
  bias short term impact assessment* (Aggarwal et al,
  2020).

5.2.1.4 Emerging Economic Challenges

Researchers

- As economics is a very broad topic, a significant
  part of the relevant literature is already included
  in other sections of this review. However, some
  specific studies deserved to be organized in their
  own section.

Relevant papers and works

- The book initially published by *Jacques Fresco,* and
  posthumously re-edited in 2018, in regards to the
  possible ways the economy could evolve for the
  betterment of the whole of humanity and the planet

thanks to technological and cultural innovation, titled *The Best That Money Can't Buy* (Fresco, 2018).

- The study conducted by *Rebecca Hasdell* of the *Stanford Basic Income Lab* in regards to the topic of Universal Basic Income titled *What we know about Universal Basic Income: A cross Synthesis of Reviews* (Hasdell, 2020).

- The analysis conducted by *Scott Santens* in regards to the inflationary potential of the Universal Basic Income, titled *Wouldn't Unconditional Basic Income Just Cause Massive Inflation?* (Santens, 2014).

- The article published by *Dylan Matthews* in regards to the inflationary potential of the Universal Basic Income, titled *A new study debunks one of the biggest arguments against basic income* (Matthews, 2017).

- The article published by *Thomas Straubhaar* in regards to the economics of the Universal Basic Income, titled *On the Economics of a Universal Basic Income* (Straubhaar, 2017).

- The article published by *Sarah Fisher* in regards to the nature of Universal Basic Income, titled *What Universal Basic Income (UBI) Is and How It Would Work* (Fisher, 2022).

- The article published by *Katharine Miller* in regards to the possible use of a Universal Basic Income in the face of generalized automation, titled *Radical Proposal: Universal Basic Income to Offset Job Losses Due to Automation* (Miller, 2021).

- The report published by *Geoffrey Okamoto* of the *International Monetary Fund*, in regards to the current state and possible evolution of the global

economy, titled *Global Economy 2021: Prospects and Challenges* (Okamoto, 2021).

- The article published in *BIS* by *Agustín Carstens* of the *Bank for International Settlements* in regards to the nature and expected evolution of Digital Currencies, titled *Digital currencies and the future of the monetary system* (Carstens, 2021).

- The report published by the *Mackinsey Global Institute*, in regards to the expected evolution of the Job Market in Europe, titled *Automation, workforce transitions, and the shifting geography of employment* (Smit et al, 2020).

- The essay collection published by *Carla Hobbs*, in regards to the possible evolution of the European economy in the face of the economic confrontation between the USA and China, titled *Europe's digital sovereignty: From rulemaker to superpower in the age of US-China rivalry* (Hobbs, 2020).

- The article published in *Forbes* by *Prince Ghosh*, in regards to the manufacturing exodus that is happening from China to other southeastern Asian nations, titled *The Exodus Of Chinese Manufacturing: Shutting Down 'The World's Factory'* (Ghosh, 2020).

- The article published in *The New York Times* by Peter *S. Goodman* and *Niraj Chokshi*, in regards to the emergent supply chain crisis born from the *Just in time* business practice, titled *How the World Ran Out of Everything* (Goodman and Chokshi, 2021).

- The article published in *CNC* by *Julia Horowitz*, in regards to the late 2021 energy crisis, titled *A global energy crisis is coming. There's no quick fix* (Horowitz, 2021).

- The article published in *The Visual Capitalist* by *Anshool Deshmukh*, in regards to the worldwide wealth distribution inequality, titled *This Simple Chart Reveals the Distribution Of Global Wealth* (Deshmukh, 2021).

- The article published in *The Interpreter* by *Evan Freidin*, in regards to digital currencies, titled *China's digital currency takes shape* (Freidin, 2021).

- The article published in *the World Economic Forum* by *Victoria Masterson*, in regards to the economic consequences of the war in Ukraine, titled *These 3 charts show the impact of war in Ukraine on global trade* (Masterson, 2021).

5.2.1.5 Emerging Political Challenges

Researchers

- Regarding emergent political challenges, I have focused my attention on the studies conducted by third-party political analysts and researchers. However, it is important to mention that because of the interdisciplinary nature of the topics of politics, governance, and diplomacy, a significant part of the literature contained within the other sections of this review also concerns them.

Relevant papers and works

- The research conducted by *Julia Pomares and Belén Abdala* of the *CIPPEC*, in regards to the possible ways that regional and global political structures could solve in the coming decades, titled *Global Governance in 2030, Prospective Scenarios on the Future of Politics* (Pomares and Abdala, 2018).

- The analysis conducted by *Bryden Spurling* of the *United States Studies Center*, in regards to limitations of representative democracy in the face of the emerging global challenges, titled *The peril of modern democracy: Short-term thinking in a long-term world* (Spurling, 2020).

- The article published by the *World Politics Review*, in regards to the rise of authoritarianism and populism, titled *What's Driving the Rise of Authoritarianism and Populism in Europe and Beyond?* (WPR, 2020).

- The article published in *Phycology Today* by *Elizabeth A. Segal*, in regards to the atrophy of empathy in relation to power, titled *Power Blocks Empathy* (Segal, 2019) [1].

- The article published in *Wbur* by *Robin Young*, in regards to the relation between empathy and power, titled *How Power Erodes Empathy, And The Steps We Can Take To Rebuild It* (Young, 2020).

- The study published by *Chiara Valsangiacomo* of the *University of Zurich*, in regards to the nature of Liquid Democracy*, titled Political Representation in Liquid Democracy* (Valsangiacomo, 2021).

- The article published in *The Harvard Gazette* by *Liz Mineo*, in regards to the racial inequality problems present in the USA, titled *Racial wealth gap may be a key to other inequities* (Mineo, 2021).

- The report published by *The World Economic Forum*, in regards to gender-based economic and social inequality, titled *Global Gender Gap Report 2021* (World Economic Forum, 2021).

- The article published in *The Human Rights Watch* by *Yaqiu Wang*, in regards to the racial inequality problems present in China, titled *From Covid to Blackface on TV, China's Racism Problem Runs Deep* (Wang, 2021).

5.2.1.6 Surveillance and Security Challenges

Researchers

- Regarding the emerging challenges associated with Surveillance and Security, I have focused my attention on the studies conducted by third-party analysts, researchers, and Journalists.

Relevant papers and works

- The article published in *Computer Weekly* by *Elliot Rosh* in regards to the relation between Security and Privacy in developed western countries, titled The greatest contest ever — privacy versus security (Rose, 2020).

- The article published in *The Guardian* by *Rob Davies* in regards to the adoption of biometric censoring technologies in surveillance systems, titled 'Conditioning an entire society': the rise of biometric data technology (Davies, 2021).

- The article published in *Brookings* by *Brendan McCord and Zoe A.Y. Weinberg*, in regards to the recognition of the security challenges posed by the new emerging technologies by the North American National Security Council, titled *How the NSC can better tackle emerging technology threats* (McCord and Weinberg, 2021).

- The article published in *The Customize Windows* by *Abhishek Ghosh*, in regards to the possible utilization of data security as a basis for its democratization, titled *Data Security as a Basis for Data Democratization* (Ghosh, 2021).

- The article published in *NPR* by *Dave Davies*, in regards to the surveillance systems employed by the Chinese government, titled *Facial Recognition And Beyond: Journalist Ventures Inside China's 'Surveillance State'* (Davies, 2021).

- The study published in *FP News* by *Robert Muggah and Greg Walton*, in regards to the surveillance systems employed in Smart Cities*, titled 'Smart' Cities Are Surveilled Cities* (Muggah and Walton, 2021).

- The article published in *CNN Business* by *Matt McFarland*, in regards to Alphabet's smart city plans, titled *Alphabet's plans to track people in its 'smart city' ring alarm bells* (McFarland, 2021).

- The article published in *Business Wire* by *Entrust*, in regards to the sharing of personal data, titled *Data from Entrust Reveals Contradictions in Consumer Sentiment Toward Data Privacy and Security in 2021* (Entrust, 2021).

- The article published in *The Conversation* by *Alex Plavevski*, in regards to the Chinese government's use of surveillance systems in the context provided by the COVID pandemic, titled *China's 'surveillance creep': how big data COVID monitoring could be used to control people post-pandemic* (Plavevski, 2021).

- The article published in *Carnegie* by *Irene Poetranto and Lotus Ruan*, in regards to the use of surveillance systems in western countries in the

context provided by the COVID pandemic, titled
Intrusive Surveillance After the Coronavirus Pandemic (Poetranto and Ruan, 2021).

5.2.1.7 Emerging Environmental and Sustainability Challenges

Researchers

- Regarding the emerging challenges associated with the state of the environment and sustainable development, I have focused my attention on the studies conducted by third-party analysts, researchers, and Journalists.

Relevant papers and works

- The article published in *Nature* by *Timothy M. Lenton and his team* regarding the tipping points of climate change, titled Climate tipping points — too risky to bet against (Lenton et al, 2018).

- The article published in *BBC Future* by *Isabelle Gerretsen* in regards to the current state of climate change, titled *The state of the climate in 2021* (Gerretsen, 2021).

- The webpage created by the *Earth Science Communications Team (NASA)* dedicated to the analysis of the climate change crisis and the many ways to counter it, titled *Global Climate Change: Vital Signs of the Planet* (NASA, 2021).

- The article published in *Carbon Brief* by *Simon Evans* in regards to the historic contributions made by nations to climate change, titled Analysis: *Which countries are historically responsible for climate change?* (Evans, 2021).

- The webpage created by the *Solar Impulse Foundation (SIF),* which is dedicated to the analysis of the climate change crisis and the many ways to counter it, titled *How to stop climate change?* (SIF, 2021).

- The article published in *Green America* by *Paul Hawken* in regards to the ways we could take action against climate change, titled *Top 10 Solutions to Reverse Climate Change* (Hawken, 2018).

- The article published in *C&EN* by *Craig Bettenhausen* in regards to the carbon emission crisis and the concept of carbon capture, titled *The life-or-death race to improve carbon capture* (Bettenhausen, 2018).

- The article published by *the Curious group* in regards to the Earth's carrying capacity limit in comparison to human population levels, titled *How many people can Earth actually support?* (Curious, 2017).

- The article published in the *Enterprise Forum* by *Paweł Nowodziński* in regards to the emergent sustainability challenges of our time, titled *ustainability Challenges* (Nowodziński, 2021).

- The article published in The Economist in regards to the COP26 climate summit, titled *Why the COP26 climate summit will be both crucial and disappointing* (The Economist, 2021).

- The webpage created by The *World Bank* Group *(TWB),* which is dedicated to the conceptualization of carbon pricing, titled *Carbon Pricing* (TWB, 2020).

5.2.1.8 Black and White Swans

Researchers

- The leading researcher in the field of Black Swans is no other than the one who introduced them as a concept: *Nassim Nicholas Taleb*.

Relevant papers and works

- The book published by *Nassim Nicholas Taleb* in regards to the concept of the Black Swan phenomena, *The Black Swan: Second Edition: The Impact of the Highly Improbable: With a new section: "On Robustness and Fragility"* (Taleb, 2010).

- The article published by *Bernard Avishai* in regards to the postulates made by *Nassim Nicholas Taleb* about the concept of the White Swan phenomena, titled *The Pandemic Isn't a Black Swan but a Portent of a More Fragile Global System* (Avishai, 2020).

- The interview conducted by *Bloomberg* in regards to the postulates made by *Nassim Nicholas Taleb* about the concept of the White Swan phenomena, titled *Nassim Taleb Says 'White Swan' Coronavirus Pandemic Was Preventable* (Bloomberg, 2020).

5.2.1.9 Emerging Natural Challenges

Researchers

- To conduct this research, I have focused on analyzing first-party studies conducted on the topic of natural threats and challenges. As this topic is intertwined with the other challenges explored in this section of the literature review, a significant part of their analysis is covered in them.

Relevant papers and works

- The study conducted by the research team led by *Peter Daszak* in regards to the emergence of novel virulent diseases in the USA titled, *Infectious Disease Threats: A Rebound To Resilience* (Daszak et al, 2021).

- The study realized by the research team led by *Lawrence O. Gostin* in regards to the creation of an international agreement against pandemics, titled *An International Agreement on Pandemic Prevention and Preparedness* (Gostin et al, 2016).

- The study conducted by the research team led by *Bruce W. Clements and Julie Ann P. Casani* in regards to the emergence of novel virulent diseases and the reemergence of previously eradicated diseases, titled *Emerging and Reemerging Infectious Disease Threats* (Clements and Casani, 2016).

- The article published by Ann Gibbons in regards to the decay of human genetic diversity, titled *How We Lost Our Diversity* (Gibbons, 2009).

- The study published by the ESA in regards to the detection and prevention of space-based hazards, titled *Space situational awareness:Detecting Space Hazards* (ESA, 2017).

- The article published by David Cox in regards to NASA's plans to prevent Supervolcanic eruptions, titled *Nasa's ambitious plan to save Earth from a supervolcano* (Cox, 2017).

5.2.2 Which ones are the key theories and hypotheses?

5.2.2.1 General Emerging challenges

Main Hypotheses

- As explained by the Millenium Project team, there are 15 contemporary Global Challenges we are currently facing as a species: achieving sustainable development while addressing climate change, the increasing scarcity of potable water, the increase of population opposed to the availability resources, the fragility of democracy, the inability of the world governments to adequately react to the new emerging challenges, the pitfalls resent on the global convergence of communication and information, the increasing gap between the rich and the poor, the emergence of new diseases that are immune to traditional antibiotic treatments, the pitfalls o modern education when it comes to preparing people to face the new emerging challenges, the increase in sociocultural and ethnic conflicts, the inability to adequately address the problem of discrimination in a global scale, the inability to properly combat large scale organized crime, the inability to meet the increasing power generation demand in a sustainable way, the difficulty of developing new technologies without falling to moral pitfalls, and the growing difficulty of incorporating ethical concerns into large scale decision making (The Millennium Project Team, 2021).

- As Rebecca Hasdell explains, we are rapidly approaching a point when implementing a Universal Basic Income, or a similar form of Guaranteed Income, may become an absolute necessity in most developed countries. However, she points out that the research

110

conducted on the topic is not yet enough to guarantee
that such a system would be implemented effectively
and without unforeseen consequences, as most UBI
experiments conducted so far have been too focused or
small in scope to study how UBI could be implemented
on a large and truly universal scale (Hasdell, 2020).

Perception and Action on the Challenges

- In general terms, until the beginning of the 21st
  century, there have been no meaningful attempts to
  collectively identify, recognize and confront
  Emerging challenges as threats to our civilization.
  Unfortunately, even in the last two decades, those
  attempts have largely been unsubstantial, or even
  detrimental, to facing these problems, a consequence
  of the nature of international politics and open
  market economics (The Millennium Project Team, 2021).

- Most of the work conducted in regards to identifying
  these challenges and how we could face them is done
  by academics, who usually require the help of large-
  scale public or private institutions to put their
  studies into practice (The Millennium Project Team,
  2021).

- Nation states tend to act on these challenges in
  isolation and only when it is beneficial for them to
  do so in the short term, which significantly reduces
  their contributions. In many cases, nation states
  even act in ways that increase the danger posed by
  these challenges because it is in their short-term
  interest, such as when a government declares the
  small-scale ownership of renewable energy generation
  systems illegal to gain the favor of electrical
  companies (The Millennium Project Team, 2021).

- Large-scale corporations behave in a similar way: in most cases only act against these challenges when it is profitable for them to do so, or when not taking such action could potentially impact them negatively, either by action or inaction (The Millennium Project Team, 2021).

- International initiatives tend to be constrained by those same political and economic situations, leading to unfocused action that ultimately accomplishes way less than it should (The Millennium Project Team, 2021).

Possible impacts

- If the international community finally decided to act against the threats posed by Emerging challenges in a profound and coordinated manner, we would be capable of taking preventive action against most of them, significantly reducing the negative impacts they could have otherwise (The Millennium Project Team, 2021).

- As most experiments conducted on the subject have demonstrated, an adequately implemented UBI would be highly beneficial to society, as it would drastically increase the mental health, economic stability, and independence of individuals while easing the bureaucratic charges imposed by less efficient forms of welfare models. However, a hasty implemented UBI would likely cause significant economic disruptions and cultural shocks (The Millennium Project Team, 2021).

5.2.2.2 Challenges posed by the New Emerging technologies

Main Hypotheses

- This is a topic that is studied in detail in the chapters dedicated to the new Emerging technologies.

- The most significant challenge we are facing in regards to the New Emerging technologies is the increasing inability that our civilization is displaying when it comes to adapting to the changes these new technologies are introducing to our world, especially when it comes to Artificial Intelligence and Intelligence augmentation technologies. Because the complexity of these technologies is increasing at an accelerating rate, we may simply reach a point in which our civilization is entirely overpassed by our technology, an event that is commonly described as a technological singularity, and we can not predict what consequences it could have (Lufkin, 2017), (Manning, 2020), (Vinge, 1993), (Kurzweil, 2005), (Shanahan, 2015).

Perception and Action on the Challenges

- There is an apparent divide between those developing the new emerging technologies and those perceiving the challenges that their generalized use could bring. This is in grand part caused by the compartmentation that usually defines the research groups that develop these technologies, which generally causes the scientist in those groups to concentrate so much on their research that they become isolated from the rest of the world (Lufkin, 2017).

- Those who discover or perceive how these new technologies could cause Emerging challenges usually

come from cultural, artistic, or anthropological
disciplines, which significantly increases the
difficulty of their studies ever reaching the
research groups who are developing the new emerging
technologies because of the traditional chasm that
has existed between the scientific and cultural
worlds (Lufkin, 2017), (Manning, 2020).

- In the few cases that scientists have combined their
  work with that of artists, and cultural researchers,
  the output of their collective work has turned out to
  be more humane and way less prone to cause unforeseen
  disruptive socioeconomic and cultural events (Lufkin,
  2017), (Manning, 2020).

- Specific governments, private organizations, and the
  international community tend to ignore or dismiss
  these challenges (Lufkin, 2017).

Possible impacts

- The nature of a technological singularity makes it
  impossible to predict what consequences it could
  have. Experts are not even sure if such a singularity
  could happen in the first place (Lufkin, 2017),
  (Lufkin, 2017), (Manning, 2020), (Vinge, 1993),
  (Kurzweil, 2005), (Shanahan, 2015)..

- If those researching the new emerging technologies
  were to combine their work with that of artists and
  cultural researchers, many of the challenges and
  threats posed by those same technologies could be
  averted. In this context, artists and cultural
  researchers would provide the emotional and empathic
  side to the scientist's practical one (Lufkin, 2017).

- If the research on Emerging technologies continues as
  it has done so far, we risk them being developed in

complete isolation from the cultural and emotional
reality of the world. There is ample evidence to
support the notion that this would have very
disruptive socioeconomic and cultural consequences
around the globe (Manning, 2020).

- The inaction of the national governments,
  corporations, and the international community is very
  worrying, as they are the only ones with the capacity
  to effectively prevent or counter the negative
  impacts of these challenges (Spurling, 2020).

5.2.2.3 Emerging Cultural Challenges

Research

- In large part, this is a topic explored in the
  dedicated culture and art chapter, so this analysis
  focuses on the perception of these challenges rather
  than the challenges themselves.

- Experts tend to agree that the most significant
  cultural challenges of our time could arise from the
  convergence of an increasingly interconnected world
  with the inability to properly account for the human
  factor when developing and utilizing new information
  and communication technologies (Anheier, 2020),
  (Phillips, 2020, p.n).

- As analyzed by experts, the most significant of these
  challenges are the increasing decay of cultural
  diversity in favor of globalized culture, the
  increase of apathetic behavior among the individuals
  that have grown accustomed to digital social networks
  and smartphones, and the increasing inability
  displayed by the academic institutions to provide an

education that can prepare the newer generations against the challenges of the future (Anheier, 2020).

- Another significant cultural challenge is the one related to the extreme commodification and biasing of contemporary news outlets and media networks. A recent study has concluded that more than 40% of the general population tends to believe any type of information as long as it is trending and polarizing, which is highly worrying. This problem has only worsened in the last decade due to the proliferation of social networks, as these platforms benefit very significantly from political and ideological polarization and confrontation (Aggarwal et al, 2020).

Perception and Action on the Challenges

- The emergent cultural challenges of our time are very insidious, a consequence of cultural globalization and the open market economy. As those two factors largely define the general social structure of the modern world in one way or another, the perception of the emergent social, cultural and artistic challenges we are facing is twisted to fulfill economic and political interests, largely disrupting the perception these challenges and diluting the action taken against them (Anheier, 2020).

- To this aspect, we have to add that the globalized social networks have changed how individuals perceive and interact with the world: now it is not uncommon to prioritize short-term gratification over delayed gratification and social acceptance over critical thought. This means that people tend to agree with whatever the social or ideological group they are a part of says, no matter what that is, and that they will shun anyone who doesn't agree with them with

extreme prejudice. This also means that those who try to think for themselves end up being socially isolated and ignored at best, or persecuted at worst (Phillips, 2020, p.n), (Gerstmann, 2020).

- While governmental organizations and information-focused corporations are making some attempts to counter the influence of biased information and fake news, their very dependence on said behaviors to guarantee their contemporary organizational structures and profit margins means that any attempt they make to counter this bias will more than likely only be an untruthful public relations campaign (Aggarwal et al, 2020).

Possible impacts

- If the critical thought of the general population is not amplified in a relatively short amount of time, the consequences for the future of our species could be very severe, as our response to the emerging challenges of our time, cultural or otherwise, would be compromised to a considerable degree (Anheier, 2020).

- Similarly, if we fail to counter the influence of biased mass media and news networks, the criticality and the situational awareness of individuals and society as a whole would be severely compromised in regard to the foreseeable future, severely decreasing our adaptability as a species (Aggarwal et al, 2020).

5.2.2.4 Emerging Economic Challenges

Main Hypotheses

- A very significant part of the emergent economic challenges of our time is related to the research and utilization of the new emerging technologies themselves. Consequently, a sizable part of the literature that concerns this subject is included in the sections focused on studying those technologies.

- In general terms, experts tend to agree that the global economy is currently at a crossroads. With a new industrial revolution looming on the horizon, the world's contemporary economic structures and supply lines are trying to reinvent themselves to stay relevant. Still, as this process is done in a largely disorganized and unprepared manner, the transition process presents itself as unpredictable and potentially unstable, a situation worsened by the still ongoing global health crisis (Okamoto, 2021), (Smit et al, 2020).

- The health crisis has revealed the fragility of the *Just In Time* industrial doctrine. As the manufacturing and transportation industries are over-optimized for specialization and efficiency at the cost of supply redundancy, the pandemic has completely disrupted global manufacturing and supply chains, creating an immense economic and professional crisis (Goodman and Chokshi, 2021).

- This crisis is amplified by the manufacturing exodus that has unfolded in recent years from China to other south-eastern Asian nations, a consequence of both the commercial war fought between the USA and China

and the increase in general life quality and wage demand among Chinese citizens, (Ghosh, 2020).

- As China reinvents itself as a tech developer leader and high-tech component manufacturer, other south-eastern Asian nations try to become the new general manufacturers of the world. Still, as this process requires time, the global economy will slow down until those emerging industries come up to speed, (Ghosh, 2020).

- Another consequence of the *Just In time* doctrine started to materialize in late 2021: as the logistics and production crisis escalated, the prices for natural gas, coal, and oil skyrocketed worldwide, causing an extreme increase in the cost of electricity. This price increase is way more significant in the nations that need to import those resources to satisfy their energy needs. As of the end of October 2021, experts agree that an extreme energy crisis is now unavoidable and that its severity will largely depend on the severity of the winter itself (Horowitz, 2021).

- This situation was only made significantly worse by the Uranian war breaking out in early 2022. As of the midpoint of this year, global inflation is skyrocketing, with food shortages becoming so intense that a worldwide food crisis might end up happening if the war doesn't conclude in a short amount of time (Masterson, 2021).

- The large-scale implementation of national digital currencies is all but assured. With the Chinese government about to roll out its electronic Yuan, the rest of the world will have to develop their digital currencies not to lag behind. However, let's consider

that because of their digital nature, these currencies will always be traceable. As a result, many privacy and personal freedom-related concerns have been raised regarding their large-scale national implementation in western countries. Those concerns will have to be solved before such an implementation can take shape in the west, which will likely turn China into the de-facto leader of digital currencies for the foreseeable future (Freidin, 2021).

- Also of important note is that, so far, most industries are demonstrating that they are incapable of making a responsible use of the new emerging technologies. As profit-making and the desire for ever-increasing growth still dictate the core doctrines of most companies and economies, we are already discovering that these technologies are being used in ways that benefit only a few to the detriment of the many (Scott Pelley, 2021).

- With the unpredictability and disruption potential that the new emerging technologies bring to the table, the implementation of a public-funded form of a Universal Basic Income has become an almost necessity in most developed and developing countries, as such a system could revitalize economies and serve as a safeguard against black swans that could disrupt the job markets (Carstens, 2021).

- Regarding wealth distribution, recent reports indicate that 45.8% of the global wealth is owned by only 1.1% of the population, those with a net worth of a million dollars or more. The next wealthiest group, those with a net worth that oscillates from 100K to 1M dollars, make up 11.1% of the global population and own 39.1% of the global wealth. The

middle class, those with a network between 10K and 100K dollars, make up 32.8% of the population and own 13.7% of the global wealth. Those with a net worth inferior to 10K dollars make up 55% of the global population, and only own 1.3% of the globe's wealth. All indicators seem to point out that, unless significant social change happens, wealth inequality will keep increasing in the coming decades (Deshmukh, 2021).

- Similarly, the wealth inequality between developed and developing nations is expected to keep increasing, with developing countries owning only 33% of the global wealth despite accounting for 42% of the worldwide wealth growth (Deshmukh, 2021).

- Above all these problems, we have to remark on the difficulties found in reconciling the profit-based nature of our current economic models with the necessity of developing a newer form of a socially equitable and ecologically sustainable industrial base and economy. This situation is exacerbated by the influence of the globalized culture, which reinforces the current economic model, and by the increasing relevance of the new emergent economies, as they don't want to compromise their progress to fulfill a positive global agenda (Fresco, 2018).

- Lastly, we also have to seriously consider that the new emerging technologies, especially those related to Artificial Intelligence and Automation, can make all of our current economic models and doctrines largely obsolete in a relatively short time. It is almost completely assured that the very nature of human work itself will be put into question in the near future (Frey and Osborn, 2017, p. 254-280).

Perception and Action on the Challenges

- While many are hopeful that our current economic models will eventually evolve to become technologically responsible, socially equitable, and ecologically sustainable, we can also say without a doubt that we are not doing enough to achieve those goals within a timeframe that would allow us to avoid many of the economic, social and ecological challenges that are looming in the horizon (Okamoto, 2021), (Fresco, 2018).

- In general terms, it seems that international industries and supply chains do not seek to reinforce the redundancy of their production and distribution pipelines, pointing out that such a change would only benefit them if another global crisis unfolds, which is largely unpredictable. Consequently, most developed economies have decided to embrace the *Just In Time* doctrine even more (Goodman and Chokshi, 2021).

- While the rapid economic development that the new emergent economies will experience through the next decade will undoubtedly increase the life quality of their population as it did to the Chinese population in the past, this development will probably come to a sudden stop when the advanced western and eastern economies complete the creation of their automated manufacturing industries in their lands (Smit et al, 2020), (Hobbs, 2020).

- It appears that most of the general population of developed countries is largely ignorant or apathetic to the emerging economic challenges of our time. This ignorance, which can be of relative use in keeping the social order stable in the short term, will have

terrible consequences once those challenges unfold. Similarly, most western governments tend to ignore the upcoming economic challenges due to the non-proactive nature of representative democracy (Spurling, 2020).

- While many UBI studies have been conducted in the past decade throughout the entire world, governments are reluctant to implement such a system on a large scale, pointing out that, while it is true that those experiments generally returned results in favor of implementing UBI, they all have been too small in scope to help us prepare for the disruptive effects that the implementation of such a system could have in the economy at large (Hasdell, 2020).

Possible impacts

- A failure to create a more robust manufacturing industry and transportation network will practically guarantee that when another global-scale disruptive event unfolds, the international economy will come to an almost complete halt, ushering in another extreme economic crisis (Goodman and Chokshi, 2021).

- If governments and corporations end up abusing the new emerging technologies, the consequences for the well-being of society, the economy, and the environment would be very disruptive (Manning, 2020).

- If we fail to adapt our economic doctrines and structures to be more socially equitable and ecologically sustainable, the mid to long-term consequences for our species and the planet we inhabit would be catastrophic (Fresco, 2018).

- Failing to implement a UBI system before the utilization of automation technologies reaches a

critical mass will have terrible socio-economic
consequences. On the other hand, hastily implementing
such a system, either now or as a consequence of
automation reaching that critical mass, could also
severely disrupt the economy (Hasdell, 2020).

5.2.2.5 Emerging Political Challenges

Main Hypotheses

- One of the most significant political challenges of
  our time resides in the difficulty of reconciling the
  nature of governance with the changes bright forth by
  the new emerging technologies and the
  responsibilities of our species towards the
  environment, especially when trying to realize that
  reconciliation in a way that promotes social
  progress, cultural and ideological diversity, and
  stability (Spurling, 2020).

- At the national level, governments appear to be
  having severe difficulties when defining their level
  of power centralization and political inclusiveness
  in a way that at the very least guarantees the
  wellbeing of their populations and the preparedness
  of their institutions in the face of the challenges
  of the future (Pomares and Abdala, 2018).

- As of today, most nations have governments defined by
  either a disorganized form of centralization and a
  severe lack of political inclusiveness, which is the
  case in most western representative democracies, or
  by an extreme form of centralization accompanied by
  an even more severe lack of political inclusiveness,
  which is the case of authoritarian regimes (Pomares
  and Abdala, 2018).

- Representative democracies have demonstrated to be inefficient and easily corruptible, as they tend to have unstable internal structures defined by the selfish nature of the political parties and the influence of the private sector. These types of democracies only think and plan for the short term, which makes them highly vulnerable to White and Black Swans and, by extension, most of the challenges posed by the future (Spurling, 2020).

- On the other hand, authoritarian regimes are far worse, as they are usually at the hands of a small number of individuals who have a highly disrupted perception of reality (Pomares and Abdala, 2018), (WPR, 2020).

- However, the most significant pitfall in contemporary governance forms is the disconnection between those with political responsibilities and those they govern. This divide tends to form as a consequence of the inversely proportionate relationships that exist between the accumulation of power and emotional empathy. Recent phycological studies have demonstrated that the emotional empathy of an individual tends to decrease as their power increases. However, it seems that, for the most part, those in power manage to keep their cognitive empathy in good health. In practice, this means that those who have power over others tend to know how those others feel and think thanks to their cognitive empathy, which allows them to control them with ease. It is also made evident that their eroded emotional empathy shields these individuals from feeling the consequences their actions have on those lives (Segal, 2019), (Young, 2020).

- While this behavior is present in practically all human disciplines, it is way more noticeable and dangerous in political, academic, and corporate disciplines for obvious reasons: the more power a person accumulates, the more isolated they become from those under their direct or indirect influence, which makes them abstract those persons until they perceive them as mere tools to be used or numbers to be computed. Consequently, those in power have a distorted perception of reality and tend to make decisions biased towards guaranteeing the immediate personal well-being of themselves and their close relatives, at the expense of everyone and everything else. However, it would be erroneous to qualify this behavior as evil, as it is in our human nature to take care of those who are close to us first. Still, it is essential for our future as a species that we manage to find a way to solve the decay of emotional empathy among those who have power over others (Segal, 2019), (Young, 2020).

- A similar thing can be said for political action based on ideology, as the erosion of emotional empathy caused by the accumulation of power tends to cloud the judgment of even those who have the best of intentions toward the rest of society (Segal, 2019), (Young, 2020).

- A possible explanation for this problem could be found in the inability of the human mind to perceive communities and environments larger than a tribal space sensibly (Cardoso, 2001).

- This problem is way more severe in those organizations and governments that have a more centralized form of power distribution, which is of great concern if we

consider that many of the new emerging technologies will facilitate the centralization of power and the further abstraction of society and the world in regards to decision making.

- Economic, social, racial, and gender-based inequality problems remain largely unresolved worldwide. While some progress has been made in developed countries, there is still much work to solve them fully. In developing countries, the situation is far worse, and many theorize that their full economic and cultural development will be necessary for positive social and economic change to take root in them (Mineo, 2021), (World Economic Forum, 2021).

- Racial inequality is still very present in the world's two most influential developed nations: the USA and China. In both cases, this is a problem rooted in a cultural and economic divide, and even if the governments of these nations decided to act to try to improve the situation, it would take many generations for the gap to close completely (Mineo, 2021), (Wang, 2021).

- Gender inequality is still very significant in most developed countries, and it is expected that it will take at least another 130 years to disappear (World Economic Forum, 2021).

- In theory, a decentralized and politically inclusive political system based on liquid democracy would have the best chances of surviving the challenges of the future, as it would guarantee empathic perception, political accountability, social wellbeing, cultural diversity, economic prosperity, fair technological distribution, and intellectual and cultural innovation. However, the implementation of such a

system would require a significant investment in education, culture, and technological innovation, something that most contemporary political parties are not willing to focus on, at least not on the level that is required (Pomares and Abdala, 2018), (Spurling, 2020), (Valsangiacomo, 2021).

- Another political proposition that is gaining much traction as of late is that of the Technocratic Socialist Meritocracy, a system characterized by a substantial level of political centralization, bounded to a significant level of political inclusiveness defined by a socialistic and meritocratic arrangement of society achieved thanks to information and automation technologies. This political system would have the advantage of being technologically very developed and socially stable while being able to provide for the needs of the many, at the cost of having a less developed emotional empathy among its hierarchy and a way less diverse cultural and ideological baseline, which would severely limit innovation, social synergy, and adaptability, making it highly vulnerable to black swan events (Pomares and Abdala, 2018).

- Nevertheless, it is important to mention that any society that attempts to incorporate the emergent computing technologies into their governmental structures will run the risk of overextending the influence of said systems, and by extension, of those who create them, a thought that is made even more troubling if we consider that Ai and General Automation research is mostly lead by the private sector (Open Ai Group, 2021).

- The increasing influence that large corporations are acquiring in both national and international affairs is of extreme concern. In many cases, these organizations are already capable of bypassing the influence of sovereign states altogether. This ability is only expected to become more severe as the new emerging technologies unfold. Curtaining their power will be necessary in order to maintain political and economic stability, as well as democratic legitimacy (Pomares and Abdala, 2018), (Scott Pelley, 2021).

- Similarly, it is also of significant concern that in the last decade, political populism, extremism, authoritarianism, and nationalism have been rising worldwide. This tendency undermines societal progress, increases the socioeconomic and racial divide, and severely limits the potential for positive International action against the emerging challenges of our time (WPR, 2020).

- Ultimately, it has become evident that in order to face the challenges of the future, our species will have to give shape to an effective form of global governance capable of effectively coordinating the international political sphere. However, doing so in a way that guarantees national sovereignty, cultural diversity, individual freedom, and economic equity presents itself as a challenging task (Pomares and Abdala, 2018).

Perception and Action on the Challenges

- It is complicated to achieve a lasting positive change in politics, because those with the power and influence to make an impact generally only want to keep the status quo in place. In contrast, the rest

of the population is content with relegating their political responsibility to others, or is forced to do so (Pomares and Abdala, 2018).

- The decay in emotional empathy commonly displayed by those who have positions of power goes largely unnoticed by society, which is of great concern (Segal, 2019), (Young, 2020).

- Recent times have demonstrated once more that it is usually only when the emerging challenges reveal themselves that those with power tend to finally take action against them and that they only do so in a disorganized and opportunistic way. As I have previously explained, this reactive and disjointed behavior will not be good enough in the face of the challenges of the future, as we need to develop a more proactive and cooperative approach to overcome them (Spurling, 2020).

- It is becoming increasingly evident that to achieve a true positive socio-political change on a significant scale things have to evolve from the bottom up, not the other way around. Developing a diverse, equitable, and healthy cultural, artistic, and academic environment on an international scale would be the logical first step in that regard. Unfortunately, most contemporary governments and private organizations tend to sideline the development of those aspects of society, and when they do dedicate resources to them, they only do so to promote an economic, electoral, or ideological agenda (Valsangiacomo, 2021).

- Failing to reconcile the nature of governance with the changes that the new emerging technologies will bring forth could have terrible consequences for all of society. The most evident consequences would be a severe increase in the economic and social divide, a severe disruption of the global economy, and the potential delegitimization of the entire political system (Pomares and Abdala, 2018).

- The most significant dangers would come from failing to form a cohesive, cooperative, and proactive front against the emerging challenges of our time. Failing to do so would severely limit the reaction capacity of our species against them, which, if we consider the nature of some of these challenges, could potentially endanger our existence (Spurling, 2020).

5.2.2.6 Surveillance and Security Challenges

Main Hypotheses

- Now more than ever, it is increasingly evident that we will have to find a balance between preserving the freedom of the individual and the security of society. However, with the advent of the new emerging technologies and challenges, it is becoming increasingly difficult for the balance not to tilt to one side or the other (Rose, 2020).

- As of 2022, all developed countries have ubiquitous surveillance and data control systems that permeate their territories. In general terms, citizens are more than willing to trade their privacy for convenience, and while in western countries, a significant part of them do ideologically oppose

giving their personal data away, they ultimately
choose to keep doing so for convenience (Entrust,
2021).

- The large-scale implementation of national or
corporate digital currencies will tilt the balance to
the side of surveillance even more, as every
transaction made with them will be traceable
(Freidin, 2021).

- While in the west, there is still much resistance to
the large-scale implementation of biometric and
automation-based surveillance systems, China is well
underway incorporating those technologies into its
existing surveillance infrastructure. If we consider
that western citizens tend to trade privacy for
convenience, it could only be a matter of time, and
marketing, for those systems to be implemented in
western countries (Entrust, 2021), (Davies, 2021),
(Davies, 2021).

- In essence, both east and west are starting to
integrate their surveillance infrastructure into the
smart city concept: the creation of convenient urban
spaces that utilize automation and information
technologies extensively. While the implementation of
smart technologies is an obvious evolutionary path
for contemporary cities to follow, their impending
hybridization with artificial intelligence,
surveillance, and biometric tracking technologies
raises many privacy and ethical concerns (Davies,
2021), (Muggah and Walton, 2021), (McFarland, 2021).

- The emerging technologies themselves pose the most
significant threat to the security of society, as
their unrestricted democratization would
significantly increase the destructive potential a

single individual could amass. Therefore, finding a balance between their ease of access and the surveillance imposed on those who utilize them will be essential for our future. However, as it may prove impractical to surveil only the part of the population that chooses to use the new emerging technologies extensively, most world nations may eventually decide to develop complete surveillance systems (McCord and Weinberg, 2021).

- The obvious added risk to the large-scale implementation of surveillance systems is that it gives those who create and utilize them an extreme amount of power over those who are surveilled. It will be key for our future that those who administrate those systems are held accountable for their actions, and they can not abuse their power in any way (Davies, 2021), (Muggah and Walton, 2021), (McFarland, 2021).

Perception and Action on the Challenges

- Security risks are of great concern to contemporary governments and large-scale organizations. However, most of them still lack the foresight necessary to prepare for the many security challenges the new emerging technologies will unfold (McCord and Weinberg, 2021).

- The inhabitants of developed western nations are largely aware of the ways that the large-scale implementation of surveillance could undermine their rights and affect their daily lives, but as many studies have demonstrated already, those same individuals will always prefer to trade their freedom and privacy for convenience and security (Rose, 2020), (Entrust, 2021).

Possible impacts

- On the one hand, a world where invasive surveillance permeates every inch of society would be, without a single doubt, a nightmarish place to live worthy of the most dystopian of science fiction stories. On the other hand, a future where such a system does not exist would be just as terrifying, as anyone intelligent enough to utilize the new emerging technologies could cause large-scale destruction if they felt inclined to do so. Finding a balance between surveillance and personal freedom will be key for the future of our species, but we don't yet know if that will be possible (Rose, 2020), (Davies, 2021), (Muggah and Walton, 2021), (McFarland, 2021).

5.2.2.7 Emerging Environmental and Sustainability Challenges

Main Hypotheses

- To say that, as a species, we have mistreated our home would be a monumental understatement. Most experts agree that if we don't take immediate collective action to correct our impact on the degradation of the environment and the climate of the Earth, the damage done would be so catastrophic that many currently populated areas would become completely uninhabitable. Other experts, however, believe that we might have already overpassed the tipping point and that correcting the damage done to the environment will be a way more difficult task than previously thought (Lenton et al, 2018), (Gerretsen, 2021), (NASA, 2021).

- The main contribution to environmental and climate destabilization comes from the large-scale emission of the greenhouse effect, causing gases deviated from human industrial processes and urban activities, chief among them Carbon dioxide, Methane, Nitrous Oxide, and Chlorofluorocarbon, with the emission of Water Vapor full-filling a feedback role in the system. As of today, those gases are emitted through processes that are key to the everyday functions of developed and developing countries (NASA, 2021).

- On top of all of this, we also have to mention the critical contribution of extreme deforestation to climate and environmental destabilization, as the decrease in plant biomass heavily limits Earth's capacity to naturally depose Carbon dioxide emissions (NASA, 2021) (SIF, 2021).

- As the greenhouse effect increases, the Earth loses part of its natural capacity to radiate sunlight-induced heat back to space, increasing the global temperature and overcharging the climate's heat dissipation capacities. This, in turn, destabilizes the weather, causing more extreme and unpredictable weather behavior: the sea level rises among the coastline, dry areas become deserts while wet areas flood constantly, heat and cold waves become way more intense, and large-scale storms and hurricanes start to appear way more frequently, in unexpected places, and with increased severity. As the weather destabilizes, so does the environment: animal species go extinct, virulent diseases increase in severity, tropical maladies start to spread to new regions, many of the farmable areas found in the southern hemisphere become infertile, and water sources dry out in many inhabited areas. Many of these changes

are already evident as of the end of 2021. The data reflect that they are just going to get worse with each passing year if no action is taken, with its most severe effects becoming evident by the end of the century (NASA, 2021) (SIF, 2021).

- The obvious way to stop the climate and environment from destabilizing further is simple in practice: we need to reduce our greenhouse emissions significantly, but this is easier said than done because all developed and developing countries depend on industries and infrastructures that constantly produce those gases. Entirely replacing polluting power generation systems with renewable energy sources, and phasing out fossil fuel-based transportation systems in favor of electric ones will significantly help reduce those emissions. However, as long as we remain dependent on the emission of greenhouse gases as a part of our industrial processes, we won't be able to prevent the situation from getting significantly worse (NASA, 2021) (SIF, 2021), (Hawken, 2018).

- In order to restore the climate balance to previous levels, we need to remove the existing excess greenhouse gases from the atmosphere and let the temperature recover by itself. The most obvious way to achieve this is through massive reforestation. However, many experts agree that at this point, large-scale geo-engineering may be necessary to fully revert the environmental decline and temperature rise (NASA, 2021), (Pearce, 2021), (SIF, 2021), (Hawken, 2018).

- Novel forms of emission capture systems, like carbon capture, could help us alleviate the number of

emissions we emit. Still, it will be essential for our mid and long-term future that we develop cleaner industrial processes (Bettenhausen, 2018).

- Apart from the climate-related challenges, the most significant environmental challenges we are facing today are those related to sustainability and human population levels. On the one hand, our industrial and economic doctrines favor short-term results over long-term planning, without any kind of regard for the environment or social equality and well-being. On the other hand, our global population levels are currently approaching the Earth's carrying capacity limit, and overpassing that limit would mean that the planet's natural resources would no longer be enough to sustain the entirety of the human population at its current resource consumption rate (Curious, 2017), (Nowodziński, 2021).

- Experts agree that it will be essential for the future of our species that we shift our economic and industrial doctrines from their current forms to fully sustainable ones. The technology to do so already exists to a large degree, but its adoption is slowed by the reactive nature of political parties and corporations (Curious, 2017), (Nowodziński, 2021).

- Reaching a sustainable global population and individual resource consumption level will be way a more difficult task to achieve. On the one hand, history has demonstrated that as developing countries become fully developed, their overall population levels decrease, but on the other, it has also become evident that the citizens of developed countries expect a way higher quality of life, and consume many more resources as a consequence. To put things in

perspective, a western middle-class citizen consumes, on average, 3.3 times the subsistence amount of food and 250 the subsistence amount of water. If everyone on the planet started to live at that resource consumption rate, the planet could only support up to 2 billion individuals. If we also consider that genetic engineering and cybernetic technologies are more than likely going to increase human life expectancy and quality drastically in the foreseeable future, it is made clear that we have no choice but to accelerate our adoption of sustainable economic and industrial doctrines. Many experts also agree that the exploitation of space-based resources will be vital to solving the sustainability problem in a definitive manner (Curious, 2017), (Nowodziński, 2021), (Fresco, 2018).

Perception and Action on the Challenges

- The emergent environmental and sustainability-related challenges of our time are well known by most of those who have the power to take significant action against them. Still, those same individuals and organizations lack the initiative to address them significantly.

- Among developed democratic countries, this problem is a direct consequence of the reactive nature of representative democracy and corporatism: governments tend to focus too much on the immediate future, which limits their action against long burn problems like climate change, whereas corporations tend to always prioritize short term economic gains over long term planning, which significantly cripples society's capacity to sift to a sustainable economic and industrial model (Spurling, 2020) (The Economist, 2021).

- Developed authoritarian countries tend to have a way higher level of initiative in this regard. However, they tend to be more impulsive and reckless when choosing solutions, and by no means are free from prioritizing short-term gains when enacting economic models. They also tend to avoid working with other nations if they can avoid doing so, which heavily limits the synergic benefits that could emerge from international cooperation (The Economist, 2021).

- The governments of developing countries tend to be way less cooperative when facing these challenges, mostly because they perceive that only by investing in nonrenewable industrial infrastructure will they be able to become developed nations. These nations usually follow China's example, reinforcing their commitment to this doctrine (Evans, 2021).

- If we consider the historical contributions to climate change, it becomes evident that western nations have a way higher responsibility to contribute to sustainable development than it might appear at first glance, but overall over-time responsibility rests on the shoulders of the USA (accounting for 20% of cumulative emissions), China (accounting for 11% of cumulative emissions) and Russia (accounting for 7% of cumulative emissions). Incidentally, these three nations have largely been reluctant to assume their responsibility, with China and Russia walking away from the last International climate summit altogether (Evans, 2021), (The Economist, 2021).

Possible impacts

- The direct consequences of unchecked climate change would be significant: the weather will become more

extreme and unpredictable, many currently populated
regions will become uninhabitable, causing massive
refugee crises, resource scarcity in especially
affected areas could lead up to the emergence of
armed conflicts, and many animal and plant species
would go extinct. It is expected that regions on the
southern hemisphere will be more severely affected by
weather destabilization than those in the northern
hemisphere, which exacerbates the problem even more
if we consider that those regions are the most
populated areas on the planet (NASA, 2021) (SIF,
2021).

- The sea level would rise across the entire planet.
  Still, it seems that experts can't agree in regards
  to how significant that increase would be: the most
  optimistic studies conclude that the sea will only
  rise by a couple of meters before the end of the
  century, while others theorize that it could increase
  by even 150 meters in that same timeframe (NASA,
  2021) (SIF, 2021).

- Failing to provide a coordinated response to climate
  destabilization could cause more harm than good, as
  an unbalanced response could destabilize the climate
  further, especially if we consider the impact that
  Geoengineering could have (Pearce, 2021), (The
  Economist, 2021).

- In a similar vein, not managing to sift our current
  commercial, economic and industrial doctrines to a
  sustainable model worldwide would have terrible
  consequences, as it would accelerate the degradation
  of the climate and the environment further, while
  also increasing the social and economic gap
  worldwide, especially the one existing between

developed and developing countries. Therefore, it is
not only essential that we adopt those sustainable
systems with relative haste, but that we do so in a
way that keeps developing countries from becoming
dependent on unsustainable doctrines to sustain their
development (Fresco, 2018), (NASA, 2021), (Hawken,
2018), (Curious, 2017).

5.2.2.8 Black and White Swans

Main Hypotheses

- As explained by Taleb, the main danger Black Swans
  pose is that they are simply impossible to predict.
  This makes even the most insignificant of Black Swans
  considerably impactful, while larger ones can be
  highly disruptive and dangerous (Taleb, 2010).

- In an inverse of the Black Swans, the danger posed by
  White Swans is that, while they are predictable
  beforehand, their low level of potential occurrence
  makes taking preemptive action against them not a
  priority from an efficiency standpoint (Avishai,
  2020), (Bloomberg, 2020).

Perception and Action on the Challenges

- As Taleb points out, it is theoretically possible to
  at least account for the dangers posed by improbable
  events in predictive models and social structures.
  Even if this is not enough to counter specific Black
  Swans, as their nature is only revealed when they
  occur, it can at least counter their general negative
  impacts and lessen the time needed to adapt to them
  (Taleb, 2010).

- As with the rest of the Emerging challenges,
  political and corporate entities tend to disregard
  Black Swans mostly because taking preventive actions
  against unpredictable events is generally detrimental
  to their short-term goals (Taleb, 2010).

- The same can be said about White Swans, but for
  different reasons, because, while they can be
  predicted, taking preventive actions against them
  would be uncomfortable or detrimental to their
  interests (Avishai, 2020), (Bloomberg, 2020).

Possible impacts

- If we consider the Emerging technologies and
  challenges that are going to be unleashed upon the
  world in the following decades, we can venture to
  say, at least with a certain degree of certainty,
  that the social and natural environment given shape
  by them will be perfect for the emergence of new
  Black Swans and the occurrence of White Swans. We
  simply can not predict what form the former will
  take, but we can expect the form of the latter
  (Taleb, 2010), (Avishai, 2020), (Bloomberg, 2020).

5.2.2.9 Emerging Natural Challenges

Main Hypotheses

- The most relevant types of emerging natural challenges
  that could significantly disrupt or threaten the human
  species in the foreseeable future are those related to
  the emergence of novel diseases, the reemergence of
  previously eradicated and isolated diseases, the
  occurrence of harmful space-based natural phenomena,
  and the eruption of super-volcanoes (Daszak et al,
  2021), (ESA, 2017), (Cox, 2017).

- Regarding the threats posed by emerging infectious diseases, the main danger comes from viral, microbial, and bacterial evolution and adaptation against proven treatments. This situation is made far worse by the increasing massification of the urban centers paired with the development of affordable international travel systems (Clements and Casani, 2016), (Gibbons, 2009).

- Similarly, the potential melting of the permafrost as a consequence of global warming, paired with the possible discovery of previously isolated human societies, might unleash previously extinct diseases back into the world. By their very nature, we would be largely defenseless against these diseases (Clements and Casani, 2016), (Gibbons, 2009).

- The increasing decay of human genetic diversity has already compromised one of our most important defenses against virulent diseases. Restoring that diversity will be critical to the long-term survival of our species (Clements and Casani, 2016), (Gibbons, 2009).

- Concerning space-based natural treats, the most significant ones are those related to foreign object impacts and solar storms (ESA, 2017).

- The Impact of large-scale foreign space objects, such as asteroids and comets, could potentially endanger life on the entire planet. Even the impact of smaller foreign space objects could prove to be fatal for large communities (ESA, 2017).

- While solar flares and storms are largely harmless to biological bodies as long as the Earth's magnetosphere shields them, significant occurrences

of those events could potentially cause enough
electromagnetic disturbances to disrupt or even
destroy our orbital-based communication systems and
planetary power and information networks (ESA, 2017).

- A single super-volcanic eruption could cover the
  entire atmosphere with ash for many months or even
  years, preventing a significant amount of sunlight
  from reaching the planetary surface and thus
  triggering an extreme ice age that we would be
  completely unprepared to face. It is stipulated that
  a super-volcanic eruption happens every 100.000
  years, roughly the amount of time that has passed
  since the last one (Cox, 2017).

Perception and Action on the Challenges

- Until recently, the International community largely
  disregarded the threat posed by emerging or remerging
  diseases as fear-mongering. Following the emergence
  of the late 2019 pandemic, it appears that nations
  around the world are finally taking this threat more
  seriously. However, it remains to be seen if the
  international community will manage to create a
  universal pandemic prevention and reaction treaty
  (Daszak et al, 2021), (Gostin et al, 2016).

- Similarly, most nations, corporations, and
  organizations worldwide tend to ignore the dangers
  posed by space-based natural treats, as taking
  preemptive action against them would give them too
  little immediate return for their investment.
  However, the most prominent space agencies of the
  world do take this threat seriously and are already
  creating plans to counter them. Nevertheless, it is

becoming increasingly evident that creating an international space threat detection and prevention agency will be critical to the long-term survival of our species (ESA, 2017).

- In regards to the dangers posed by Solar flares and Storms, these agencies reiterate the importance of redesigning our planetary power, communication, and information systems to be as resilient to electromagnetic pulses as possible (ESA, 2017).

- In regards to super-volcanic eruptions, the international community is also reluctant to take preemptive action against them, mostly for economic and political reasons, as the Geoengineering projects necessary to prevent their eruption would be costly and would offer no evident return for the investment made. A study realized by NASA in 2017, however, managed to devise a Geoengineering project that would cool the super-volcanoes with a 10km deep pressurized water loop that would not only keep the volcanoes from erupting but would also generate 6GW of constant power, which should incentivize national governments and corporations to take action (Cox, 2017).

Possible impacts

- As the recent pandemic has demonstrated, failing to create a cohesive and effective international treaty to detect and counter preemptively, or at least curtain, the emergence of new diseases could prove to be fatal to our entire species (Daszak et al, 2021), (Gostin et al, 2016).

- Most significantly, if no preemptive action is taken, the emergence of an antibiotic-resistant and highly contagious bacteria could easily eradicate most of

the human population in the span of a few years
(Clements and Casani, 2016).

- Failing to create an effective system to prevent the
  impact of space-based foreign objects on the planet
  Earth could potentially endanger all life on the
  planet (ESA, 2017).

- Failing to create an effective system to detect solar
  storms, and failing to redesign our planetary power,
  information, and communication systems to be more
  resilient against EMP pulses could potentially knock
  out those same systems for entire weeks on a
  worldwide scale (ESA, 2017).

- Failing to take preemptive action against super-
  volcanoes could unleash an ice age that would more
  than likely kill most of the life on the planet
  (Cox, 2017).

5.2.3 Which ones are the gaps my research is trying to fill?

5.2.3.1 General Emerging challenges

Gaps

- Most of these studies and initiatives do not even
  consider that culture and art could play a
  significant role in facing the emerging challenges of
  our time, and those that do, like the work conducted
  by The millennium project, only do so as an
  afterthought.

- My research aims to explore ways in which we could
  better prepare for and eventually face these challenges
  through cultural and artistic means that would work in
  conjunction with more traditional models.

5.2.3.2 Challenges posed by the New Emerging technologies

Gaps

- It is evident that the research teams developing the new emerging technologies do so in a social vacuum. Consequently, they do not consider the economic, sociological, psychological, philosophical, cultural, and artistic consequences their research could have.

- My research aims to study and propose possible ways through which the scientific and cultural disciplines could be hybridized to guarantee that these new technologies are developed taking their potential impact on society into account, making them way more humane out of the box.

5.2.3.3 Emerging Cultural Challenges

Gaps

- This topic is explored in the chapter dedicated to culture.

5.2.3.4 Emerging Economic Challenges

Gaps

- My research aims to explore the possible ways through which art and culture could help us adapt contemporary economic models to the challenges of the future, both in direct and indirect ways.

- By designing an alternative network for cultural, artistic, and academic creation and interaction, I aspire to inspire the creation of a system that could, among many other things, work as an

interdisciplinary focal point for the development of
newer, more progressive, and sustainable forms of
economy.

- I'll also explore the value of preserving cultural
  diversity to reinforce economic robustness in the
  face of cultural homogenization, as natural selection
  dictates that a less diverse system is more
  vulnerable to the disruptive impacts caused by
  unforeseen events.

- Ultimately, my research will explore the value of
  encouraging and transmitting the creative and
  passionate way of being of the artist to the general
  populace as a solution to the existential crisis that
  will unfold when automation evolves enough to take
  over most contemporary professional tasks.

5.2.3.5 Emerging Political Challenges

Gaps

- Technically my research is not political in nature,
  but it does have ample political considerations, as
  the cultural, artistic, and academic social network
  that I'll design and propose through it could
  potentially drive positive political innovation and
  change.

5.2.3.6 Surveillance and Security Challenges

Gaps

- Even if we consider that my research only analyzes
  the concept of surveillance in a contextual manner,
  it will explore the possibility of encouraging the

emergence of more empathetic security and
surveillance solutions through cultural and artistic
discourse.

5.2.3.7 Emerging Environmental and Sustainability Challenges

Gaps

- In regards to this topic, my research will focus on
exploring the relationship between culture and the
emergent environmental and sustainability challenges
of our time, with the hopes of discovering where
contemporary cultures fail in regards to increasing
social awareness and action against them.

5.2.3.8 Back and White Swans

Gaps

- Among other things, my research will propose and
explore the conceptualization of a new type of
cultural, artistic, and academic social network that
could help us deal with Black and White Swans from
the baseline of society.

5.2.3.9 Emerging Natural Challenges

Gaps

- My research aims to explore ways in which we could
better prepare for and eventually face these natural
challenges through cultural and artistic means that
would work in conjunction with more traditional
models.

5.3 Evolution, Emergence, and Natural Neural networks

While the previous two sections of this literature review focused on the Emerging technologies and Emerging challenges of our time, this section is dedicated to analyzing the research conducted on the evolution of life, intelligence, and consciousness explained as emergent behaviors. The literature concerning the nature and form of natural neural networks is also studied in this section.

Life, Intelligence, and Consciousness as an Emergent Behavior

- To say that this is a controversial topic within the scientific community would be a monumental understatement. In essence, this research field tries to study and explain how life, intelligence, and consciousness can emerge from the synergic interaction of simpler elements when certain environmental conditions are met. These researchers are then divided into two main groups: those who think that this whole process can be explained as a form of weak emergence, and thus all of the constituents and stages of the process can be analyzed, and those who believe that the more complex

parts of it, especially consciousness, can only be understood as forms of strong emergence, as some parts of the process are apparently too complex to be understood by a human mind. In any case, it is essential to mention that these theories work in conjunction with what is said in Darwin's theory of evolution, as they ultimately try to add to said theory by trying to explain the beginning of life, intelligence, and consciousness in a scientific manner.

- Regarding this topic, my research is focused on studying how life, intelligence, and emergence can be explained as emergent behaviors, with the interest of designing new forms of social, cultural, and educational networks that try to mimic such phenomena.

Social Structures as an Emergent Behavior

- This section is dedicated to studying the social behavior of complex, intelligent beings as emergent behaviors, with the interest of determining how a social network could be designed to foment the emergence of positive novel social behaviors while preserving the uniqueness of specific human beings.

Natural Neural Networks

- This is a very extensive and interesting topic, as it explores the form of natural neural networks and minds. My research focuses on analyzing the nature and workings of such systems with the interest of designing new forms of social, cultural, and educational networks that mimic them.

Natural Evolution

- The topic of evolution, as a whole, is defined as a
  natural process. My research explores this topic
  contextually to identify the natural characteristics
  and laws that define every human being, with the goal
  of configuring a framework from which to construct
  sensible artistic, cultural, and academic postulates.

5.3.1 Which ones are the Key Papers, Authors, and Works?

There exist two schools of thought in regards to the studies
that try to explain the evolution of life, intelligence, and
consciousness as emergent behaviors, those who think that all of
them can be explained as forms of weak emergence, and those who
believe that some parts of those processes can't be understood,
and thus are caused by strong emergence. To maintain
objectivity, this study focuses on the work conducted by two
research groups, each of them pertaining to one of those schools
of thought. As the topic of Natural Neural Networks is less
divisive, it only requires a single viewpoint.

5.3.1.1 Life, Intelligence, and Consciousness as an Emergent Behavior

Researchers

- On the side of those who study these phenomena as a
  form of weak emergence, this study focuses on the
  work conducted by Todd E. Feinberg, Jon Mallatt, J.
  Scott Jordan, and Marcello Ghin.

- On the side of those who study these phenomena as a
  form of strong emergence, this study focuses on the
  work conducted by David Chalmers.

- The study conducted by *Todd E. Feinberg of the School of Medicine at Mount Sinai* and *Jon Mallatt, J. Of the University of Washington* in regards to the explanation of life, intelligence, and consciousness as a weak emergent, in an attempt to try to solve the explanatory gap that exists in the field, titled *Phenomenal Consciousness and Emergence: Eliminating the Explanatory Gap* (Feinberg and Mallatt, 2020).

- The study conducted by *Scott Jordan of the Department of Physiology of the Illinois State University* and *Marcello Ghin of the Faculty of Cultural Sciences of the University of Paderborn* in regards to the study of life, intelligence, and consciousness as a weak emergent caused by the adaptation of natural systems to rapid change, titled *(Proto-) Consciousness as a Contextually Emergent Property of Self-Sustaining Systems* (Jordan and Ghin, 2006, p.n).

- The book published by *David Chalmers* of the *Research School of Social Sciences of the National University of Australia* to the study of life, intelligence and consciousness as a strong emergent, titled *Facing up to the problem of consciousness* (Chalmers, 1996, p.n).

5.3.1.2 Social Structures as an Emergent Behavior

Researchers

- This section mostly focuses on the study conducted by Christopher K. Tokita and Corina E. Tarnita on the topic of emergent behavioral specialization and modular social networks. Other sociological studies are also analyzed.

- The study conducted by *Christopher K. Tokita and Corina E. Tarnita of the Department of Ecology and Evolutionary Biology, Princeton University,* in regards to the study of social behavior and structures as emergent behaviors, titled *Social influence and interaction bias can drive emergent behavioral specialization and modular social networks across systems* (Tokita and Tarnita, 2020).

- The compilation about sociological structures published in Lumen, in regards to the Limits and effects of Group Size as studied by *Dr. Robin Dunbar*, the effects of peer influence as studied by *Solomon Asch*, and the power of authority as studied by *Stanley Milgram,* titled *Group Dynamics* (Lumen, 2021).

5.3.1.3 Natural Neural Networks

Researchers

- The study of Natural Neural Networks is a very complex research field that tends to overlap with many others, and as a consequence, it is already explored to a large degree in the section dedicated to the study of life, intelligence, and consciousness. Therefore, this section of the dissertation is dedicated to studying the specific structure and communication systems employed by Natural Neural Networks, a goal that is achieved by analyzing third-party articles written on the subject.

Relevant papers and works

- The article published by *Branislav Holländer* in regards to the nature and differences between Natural Neural Networks and Artificial neural Networks, titled *Natural vs Artificial Neural Networks* (Holländer, 2018).

- The article published by the *John Hopkins Institute of Medicine* in regards to the structure and workings of Natural Neural Networks, titled *Brain Anatomy and How the Brain Works* (John Hopkins Medicine, 2021)

5.3.1.4 Natural Evolution

Researchers

- The foundations of evolutionary theory were set by *Charles Darwin* and *Alfred Russel Wallace* and were encoded in the book *On the Origin of Species* (Darwin, 1859), giving birth to the Darwinist theory of evolution. Contemporary evolutionary theories stem from said theory.

- It is also very relevant to mention the studies conducted by Dawkins R. Z Tierpsychol and *Zachary Yoscovits* in regard to natural cultural evolution.

Relevant papers and works

- The book published by *Charles Darwin* with the contribution of *Alfred Russel Wallace* in regards to the evolution of the species, titled *On the Origin of Species* (Darwin, 1859).

- The article published by *Ernst Mayr* about the refinement of natural evolution theories through the 20th century, titled *The objects of selection* (Mayr, 1997).

- The article published by *Christine A. Andrews* about the role of genetic drift and flow in natural selection, titled *Natural Selection, Genetic Drift, and Gene Flow Do Not Act in Isolation in Natural Populations* (Andrews, 2020).

- The study published by *Zachary Yoscovits* about memetic-based cultural evolution, titled *Memetics: The Evolution of Culture* (Yoscovits, 2009).

- The study published by *Jean-Pierre Bocquet-Appel* in regards to the neolithic revolution, titled *Neolithic Demographic Transition* (Bocquet-Appel, 2011).

- The study published by *The University of Stanford* in regards to the influence of natural selection on culture (Stanford, 2008).

- The study published by *The University of Stanford* in regards to the influence of natural selection on culture (Stanford, 2008).

- The first book published by *Jared Diamond* in regards to the influence of the environment in the evolution of societies and technology, titled *Guns, Germs, and Steel: The Fates of Human Societies* (Diamond, 1999).

- The second book published by *Jared Diamond* in regards to the influence of the environment in the evolution of societies and technology, titled *The World Until Yesterday: What Can We Learn from Traditional Societies?* (Diamond, 2013).

- The study published by *Brian F. Snyder* in regards to the relation of unsustainability with social and technological evolution, titled *The genetic and cultural evolution of unsustainability* (Snyder, 2020).

- The study published by *Silvia Helena Cardoso* in regards to the tribal legacy of the human mind, titled *Transcending the Tribal Mind* (Cardoso, 2001).

5.3.2 Which ones are the key theories and hypotheses?

5.3.2.1 Life, Intelligence, and Consciousness as an Emergent Behavior

Research and hypothesis

- On a baseline level, all the theories that try to explain the emergence and evolution of Life, Intelligence, and Consciousness as an Emergent Behavior tend to agree on the general workings of the process: in a given environment defined by natural laws, simple elements tend to form more complex behaviors when certain environmental conditions are met. These new behaviors give shape to an emergent capable of behaving on a more complex and novel level, an entity that is defined by its constituents but that does not control them in an imposing manner. The constituents and the emergent establish a symbiotic relationship in which the former gives shape to the latter, and the latter stabilizes the former in a way that guarantees their continued existence. The emergent then starts to interact with other entities similar to it in complexity, giving shape to even more complex emergents when the environmental conditions are adequate. This forms a scalar chain of emergents that defines the evolution of life and intelligence, with the time needed for more complex emergents to be formed decreasing with each level (Chalmers, 1996, p.n), (Jordan and Ghin, 2006, p.n), (Feinberg and Mallatt, 2020).

- The main divide between those researching this topic comes from the difficulty of explaining consciousness as an emergent behavior. As consciousness is inherently subjective, it is simply not possible to study it in an objective manner. In consequence, two schools of thought have emerged in regards to this discussion: those who think that we will never be able to explain consciousness in a traditionally scientific way because of its inherent subjectivity, and thus clarify it as a strong emergent process (an emergent that can't be explained by traditional means), and those who believe that we simply have to keep trying and that we will eventually be able to explain consciousness as a scientific process, and thus believe that it is a weak emergent (an emergent whose behavior can be fully explained scientifically) (Chalmers, 1996, p.n), (Jordan and Ghin, 2006, p.n), (Feinberg and Mallatt, 2020).

5.3.2.2 Social Structures as an Emergent Behavior

Research and hypothesis

- The study conducted by Christopher K. Tokita and Corina E. Tarnita concludes that there are clear parallels between the structures of the emergent behaviors that define the workings of living beings and those that define societies, as the mechanism that determines the emergence of complex modularity on organic systems is similar to that that triggers it on social structures: as a specific system grows in size, its constituents tend to organize into specialized groups, up to its maximum organizational complexity capacity, as a response to environmental challenges. This specialization allows the system to

perform more complex tasks, thus permitting it to adapt to the environment (Tokita and Tarnita, 2020).

- The chances for a social behavioral emergent to occur are determined by its base ideological and behavioral diversity (homophily/heterophily), the social influence present in the group (negative or positive), the interaction bias (bias caused by interaction with someone else), and by group size (Tokita and Tarnita, 2020).

- The smallest group size is made of two persons and is called a dyad, but dyads are unstable because no one can mediate between the two present points of view. The smallest stable group size is made of three persons and is called a triad because the third individual can work as a mediator when a conflict arises. The largest group size in which behavioral cohesion, empathy, and objectivity can be maintained significantly oscillates between 100 and 230 individuals, a factor that is determined by the number of individuals the human mind can remember in detail, which is known as Dunbar's number. Groups larger than 230-250 individuals must subdivide to maintain cohesion (Lumen, 2021).

- In small groups, homophily (being alongside similarly minded individuals) with positive influence (the group encouraging the individual to become more like the group) tends to cause the best novel social behaviors to emerge as a consequence of a feedback loop caused by social influence and interactions. However, if the positive influence becomes too extreme, the group becomes too homogeneous, and the emergent dissolves. Consequently, it is vital to find a balance between positive and negative group

influences (as negative ones tend to make a group
more diverse), and thus a balance between the unique
point of view of the individual and that of the group
(Tokita and Tarnita, 2020).

- Large groups tend to subdivide hierarchically to
  maintain cohesion, but as a group becomes larger, it
  becomes harder to keep it from dissolving into smaller
  forms. Centralized leadership improves stability and
  cohesion at the cost of objectivity, diversity,
  empathy, and emergent behavioral potential.
  Decentralized democratic leadership improves cohesion
  without sacrificing inner group diversity, but
  requires its components to think and act critically,
  sensibly, and with responsibility in order to preserve
  objectivity and empathy (Lumen, 2021).

- In large social structures, heterophily (understood
  in this case as the differences between specialized
  groups) driven by negative influence (each group
  influencing the other groups to be different) has the
  best chances of promoting novel organizational
  emergent behaviors. However, too much negative
  influence can lead to conflict and destructive
  interactions; thus, striking a balance is critical.
  Regarding heterogeneous groups, interaction bias has
  no effect (Tokita and Tarnita, 2020).

- If a large social structure is heterogeneous and has
  plenty of positive social influence, society tends to
  homogenize itself too much, thus explaining the
  diluting nature of cultural globalization (Tokita and
  Tarnita, 2020).

- The many aspects that constitute a society interact
  with each other directly and indirectly, shaping
  emerging systems that enhance cohesion as long as

their relationship is adequate for their complexity level (Tokita and Tarnita, 2020), (Lumen, 2021).

5.3.2.3 Natural Neural Networks

Research and hypothesis

- In general terms, experts tend to agree that there is still much to be discovered in regard to the structure and functions of the Natural Neural Networks found in complex organic brains, but what we know already is enough to design computing systems that can emulate part of their behavior (John Hopkins Medicine, 2021).

- Natural Neurons utilize an electric impulse-based binary information system that changes over time instead of being instantaneous, a system not very dissimilar from frequency modulation, which allows for a way more extensive expression of information to be transmitted from a neuron to others. Artificial Neural Networks utilize a continuous signal model that, while being more reactive, is way less computationally capable (John Hopkins Medicine, 2021).

- Artificial Neural Networks are closed systems; once one is designed and created, the way it processes information does not vary, which makes them entirely dependent on a large amount of data to learn, and heavily limits their adaptability to learn things outside their exact original scope. On the other hand, Natural Neural Networks tend to change their structure by reinforcing the connections between those neurons that exhibit a lot of activity, allowing them to adapt to new types of information

and learn completely new things (John Hopkins
Medicine, 2021).

- Natural neural networks are way more power efficient
than their artificial counterparts, which allows them
to form vastly complex 3D structures, as opposed to
the 2D Artificial Ones (John Hopkins Medicine, 2021).

5.3.2.4 Natural Evolution

Research and hypothesis

- Charles Darwin and Alfred Russel Wallace set the
foundations of biological evolution through the
creation of the Darwinist theory of evolution. This
theory defined the concept of Natural Selection,
posing it as the main force behind biological
evolution: the members of a given species naturally
mutate through their exposure to the environment or by
reproduction, diversifying the genetic pool of the
species in the process. Those in the species that
develop biological traits more fitted to survive in a
specific environment or against an environmental
change manage to adapt to the environment and
reproduce more than those who don't, thus transmitting
their mutations and making them a defining
characteristic of their species (Darwin, 1859).

- Ultimately evolution in itself is the prolonged
adaptation to the environment of a given species by
natural selection, which in turn drives the increase
in the frequency of a given genetic trait in said
species (the latter is a consequence of the former,
not the other way around as it is usually portrayed)
(Mayr, 1997).

- Similarly, it is evolution that causes genetic diversity to emerge in response to environmental diversity. Genetic mutation drift and flow also play a significant role in said process independently of natural selection. Genetic diversity plays a crucial role in guaranteeing environmental adaptation, because a more diverse genetic pool increases the chances of a species adapting to environmental changes through natural selection (Darwin, 1859), (Andrews, 2020), (Mayr, 1997).

- If a series of genetic mutations caused by genetic drift and flow become prevalent enough in a species without said mutations interfering with its ability to survive in its inhabited environment, evolution can happen without the influence of natural selection (Andrews, 2020).

- There is much evidence to support the theory that the human being stopped biologically evolving in a significant way when technology became complex enough to allow us to adapt to most environments and situations independently of natural selection, with the two main milestones being the encoding of the human brain in the context of the nomad tribes 100.000 years ago, and the technological and cultural explosion caused by the Neolithic revolution (Cardoso, 2001), (Bocquet-Appel, 2011).

- Many parallels exist between biological and cultural evolution. The Memetic theory attempts to gap both fields, offering an explanation of cultural evolution in parallel to biological evolution, with memes (a basic transmittable idea or concept in a given culture) being the base unit instead of the gene. This implies that most of the rules that define

biological evolution also apply to cultural evolution and can help us understand it (Yoscovits, 2009).

- This concept was further studied and expanded by the bio-geographist *Jared Diamond*. He posed that the environmental differences between different continents and regions played a crucial role in defining the evolution of culture and technology in a similar way to biological evolution, with those continents that permitted the emergence of widespread agriculture and animal husbandry leading to the emergence of the more advanced societies (Diamond, 2013), (Diamond, 1999).

- Lastly, the study conducted by *Brian F. Snyder* remarks on the connection that exists between the advancement of culture and technology with the proliferation of unsustainable practices as a consequence of competing societies being forced to increase their capabilities and access to resources in order to not fall behind competing for human groups (Snyder, 2020).

5.3.3 Which ones are the gaps my research is trying to fill?

5.3.3.1 Life, Intelligence, and Consciousness as an Emergent Behavior

Gaps

- As already explained, the most significant gap in this field is the difficulty in analyzing Consciousness scientifically because of its inherent subjectivity, which makes explaining it as a weak emergent impossible.

- While my study will not attempt to fill this gap
  directly, it will explore the concept of the
  hypothetical emergence of a gestalt mind born from
  the collective interaction of the human civilization.

- Arguably, in such an environment, human beings would
  be able to experience the formation and existence of
  an emergent, intelligent, conscious mind without
  having to yield any of their personality or
  independence. In such an environment, consciousness
  as a weak emergent would be proved by collective and
  simultaneous experience.

- Ultimately, however, aside from the hypothetical
  development explained above, my thesis would focus on
  adapting the structural process of emergent behaviors
  to design a new generation of cultural, artistic, and
  academic environments and networks.

5.3.3.2 Social Structures as an Emergent Behavior

Gaps

- In my thesis, I'll analyze the social structures that
  foment the occurrence of positive emergent behaviors
  to conceptualize a new form of interdisciplinary
  emergent network that could lead to a positive human
  evolutive emergence. However, It is not the goal of
  this dissertation to design an emergent network, as
  said endeavor would go far beyond its focus. Instead,
  through this dissertation, I will attempt to lay a
  foundation from which further research could be
  conducted regarding this topic.

5.3.3.3 Natural Neural Networks

Gaps

- As it is mainly studied in a contextual manner, there are no direct gaps in this field that my thesis is trying to fill.

- My thesis will take inspiration from the structures and behaviors of Natural Neural Networks to design a new generation of cultural, artistic, and academic networks.

5.3.3.4 Natural Evolution

Gaps

- My dissertation will attempt to explore the parallels between biological and cultural evolution with the interest of conceptualizing sensible forms of art, culture, and academia.

5.4 Contemporary Culture

Culture is a very difficult matter to define and study, and much more so since the beginning of the information age. In this section, I'll review the literature I have found relevant to the study of this topic in the context of my dissertation.

Culture of the information age

- This category is centered in the literature that concerns the study of the nature and evolution of culture since the beginning of the information age and thus focuses on analyzing the changes that the information technologies like personal computing, the internet, social networks, and portable telephoning and computing have brought to it.

Western and Eastern Culture, differences and Globalization

- This section is dedicated to reviewing the literature that studies contemporary globalized cultures, in the context of the growing confrontation between western and eastern cultures.

Alternative Cultural Movements

- This section reviews the literature that studies the
  emergence of alternative cultural currents not
  defined by globalized or national cultures.

5.4.1 Which ones are the Key Papers, Authors, and Works?

As culture is a vast and interdisciplinary topic, I have
based my analysis of it on a series of first-hand studies
conducted by experts on culture, physiology, communication,
economy, and education. The analysis of these studies is then
complimented by the reading and analysis of third-party
articles.

5.4.1.1 Culture of the information age

Researchers

- In regards to this topic, my research focuses on the
  work conducted by various researchers belonging to
  the fields of cultural studies, sociology,
  physiology, and economy giving important attention to
  the work conducted by Ramón Zallo Elguezabal, whose
  publications provide an ample overview of
  contemporary cultural structures.

Relevant papers and works

- The book published by *Ramón Zallo Elguezabal of the
  University of the Basque Country* in regards to nature
  and structures of contemporary culture and
  communication systems, titled *Estructuras de la
  comunicación y la cultura: Políticas para la era
  digital* (Zallo, 2011).

- The article published by *James L. Watson* in regards to the nature of globalized culture, titled *Cultural Globalization* (Watson, 2020).

- The article published by *Michael Bossetta* in regards to the architecture of social networks, titled *The Digital Architectures of Social Media: Comparing Political Campaigning on Facebook, Twitter, Instagram, and Snapchat in the 2016 U.S. Election* (Bossetta, 2018).

- The article published by *Terry Nguyen* in regards to the nature of subscription-based media services, titled *How subscriptions took over our lives* (Nguyen, 2021).

- The article published by *Justin Jun* in regards to the way social networks trivialize our lives, titled *Social media trivializes our lives* (Yun, 2021).

- The article published by *Linda Laino* in regards to the normalization of creative mediocrity, titled *Mediocre is the New Amazing* (Laino, 2019).

- The article published by *Ruby Phillips* in regards to nature and challenges posed by *Woke* culture, titled *The problem with "woke" culture* (Phillips, 2020).

- The article published by *Rachel Liu* in regards to nature and challenges posed by media activism and *Woke* culture, titled *Woke: The Dangers and Possibilities of Social Media Activism and Woke Washing* (Liu, 2020).

- The article published by *Richard Fisher* in regards to nature and challenges posed by media activism and *Cancel Culture*, titled *Often derided, online activism is far more effective than it first appears — but*

*there are big differences between how the political
left and right deploy it to spread ideas* (Fisher,
2020).

- The podcast published by the *American Psychological
  Association* in regards to the decay of empathy and
  rise of narcissism in newer generations, titled
  *Speaking of Psychology: The decline of empathy and
  the rise of narcissism* (APA, 2019).

- The article published by *Sara Konrath* in regards to
  the increasing professional burnout, titled *Between
  burnout and the bends: Cascading crises have created
  a burnout epidemic* (Konrath, 2020).

- The article published by *Scott Pelley* in regards to
  the Facebook information control scandal of 2021,
  titled *Whistleblower: Facebook is misleading the
  public on progress against hate speech, violence, and
  misinformation* (Scott Pelley, 2021).

5.4.1.2 Western and Eastern Cultures, differences, and Globalization

Researchers

- For the research of this topic, this dissertation
  focuses on the work conducted by various researchers
  belonging to the fields of cultural studies,
  sociology, and economy, giving important attention to
  the work conducted by Claudio F. González, as his
  first-hand experience with Chinese culture and
  education is greatly translated into his works on the
  subject.

- The book published by *Claudio F. González* in regards to the nature of contemporary Chinese culture and economics, titled *El gran sueño de China. Tecno-Socialismo y capitalismo de estado* (González, 2021).

- The study published by *Ma Jenina N. Nalipay, Ronnel B. King, and Yuyang Cai* in regards to the perception of personal autonomy in eastern and western cultures, titled *Autonomy is equally important across East and West: Testing the cross-cultural universality of self-determination theory* (Nalipay, King and Cai, 2020).

- The article published by *Chris Stokel-Walker* in regards to the increasing influence of Chinese-created smartphone applications in western society, titled H*ow China could shape the future of technology* (Stokel-Walker, 2020).

- The article published by *Chris William Yang* in regards to the way through which China is trying to export its soft power, titled *How China is trying to export its soft power* (William Yang, 2018).

- The article published by *Tanmay Patil* in regards to the differences between eastern and western cultures, titled *Understanding the Difference Between Eastern & Western Culture* (Patil, 2020).

5.4.1.3 Alternative Cultural Movements

Researchers

- For the research on this topic, this dissertation focuses on the work conducted by various researchers

belonging to the fields of cultural studies, sociology, and economics.

Relevant papers and works

- The study published by *Gleb Dmitrievich Leontyev and Ludmila Stanislavovna Leontieva* in regards to nature and possibilities offered by the Alter-Globalization movement, titled *Metaphysical Foundations of Alter-Globalization* (Leontyev and Leontieva, 2020)[10.4.1.9]

- The article published by *Ahmed El Attar* in regards to the nature of globalization and the possibilities offered by the Alter-Globalization movement, titled *The alter-globalization movement: An alternative perspective of an alternative world* (Attar, 2020).

5.4.2 Which ones are the key theories and hypotheses?

5.4.2.1 Culture of the information age

Research and hypothesis

- The culture of the information age was born from the fusion of the globalized culture of the late 20th century with the communication and information technologies developed in the early 21st century (Zallo, 2011).

- This culture is a new form of globalized culture that, while being primarily based on the same ideological and commercial values that defined its predecessor, is influenced to a considerable degree by the organizations and corporations that create and maintain the information and communication systems of our time (Zallo, 2011).

- As these organizations largely define how individuals perceive and interact with the world around them, it could be said that their influence in regards to determining the way of thought and behavior of persons bypasses that of nation-states and specific national cultures, which in itself represents a threat to democracy in democratic alighted countries (Scott Pelley, 2021).

- Mass media entertainment makers and news networks also influence this culture, but not to the same degree as the service providers. As a consequence, most media makers have engaged in a race to develop their own distribution platforms, leading to a very fractured entertainment market that is saturated with mediocre products, and an extremely polarized and biased information offering primarily dominated by social media platforms (Zallo, 2011), (Nguyen, 2021), (Bossetta, 2018).

- Due to the proliferation of wireless communication and portable computing technologies, this form of culture permeates practically all of the developed world, while developing countries increase their contact with it as they modernize their information infrastructure (Zallo, 2011).

- Unlike in the past, when the globalized culture emanated almost exclusively from western countries to the rest of the world, this new form of culture is also starting to be influenced by eastern organizations and corporations, most notably those from china (William Yang, 2018).

- Because social networks and mass media platforms determine social and physiological behavior, most individuals develop personalities that are aligned with those platforms' best interests (Phillips, 2020, p.n).

- The most evident social behaviors that are encouraged by these platforms are as follows: the pursuit of instant gratification, the constant consumption of many short pieces of media and entertainment, the constant consumption of information, the need for continuous social immediacy, the disregarding of personal responsibility in favor of the creation of a digital persona that shields the individuals from the consequences of their actions, the disregarding of privacy, the departure from the intimacy of interpersonal relations in favor of mass social interaction, the need to adhere to a trending form of ideology to increase social interaction and acceptance, the discouragement of critical and independent thought, and the encouragement of ideological extremism and confrontation (Yun, 2021).

- These behavioral changes trivialize most social interactions, as well as empathy and responsibility, as individuals tend to externalize and delegate these aspects of themselves to the social and information networks they use (Yun, 2021), (Phillips, 2020, p.n).

- A similar thing tends to happen with the exchange of ideologies. Individuals tend to externalize their critical thought to trending ideological groups, causing the trivialization of social issues and political debate. The ultimate consequence of this is a cultural and social environment in which it appears that a huge part of society partakes in fighting social issues, but that ultimately only reinforces the adherence to those ideological groups as a way to gain social acceptance (Bossetta, 2018).

- A recent example in this regard is the relatively new *Woke* culture, defined by the appropriation,

trivialization, infantilization, and
commercialization of LGTBI issues and other social
problems. Oriented to the more recent generations,
most social media platforms and content providers
reinforce this culture as a form of entertainment and
social interchange, distorting the perception that
society has in regards to these issues, and severely
limiting the action that could be taken to solve them
(Phillips, 2020).

- Another related consequence of this is the
  trivialization of ideological confrontation and
  debate. Because social media platforms encourage the
  persecution of non-public opinion-compliant
  individuals as a way to gain popularity, it is
  increasingly common to see social justice groups
  directly attacking those individuals in the social
  networks for the most insignificant of offenses. In
  many cases, these groups cause significant harm to
  the social, professional, and even personal life of
  the individuals they choose as targets. This is what
  is commonly known as *Cancel Culture*, as it encourages
  the social cancelation of non-public opinion-
  compliant persons (Gerstmann, 2020), (Fisher, 2020).

- The same organizations and corporations similarly
  define the cultural products of the digital age: most
  contemporary media is tailored for mass express
  consumption in a personal private manner and a
  digitally public way, so the new generation media
  pieces tend to be short, similar to each other and,
  at best, of average quality (Laino, 2019).

- Most mass media makers tend to follow the ideological
  line set by the globalized culture, avoiding
  innovation in most cases in favor of creating non-

controversial and public opinion-compliant pieces
that are commercially successful but culturally
mediocre (Laino, 2019).

5.4.2.2 Western and Eastern Cultures, differences, and Globalization

Research and hypothesis

- From the start of the second half of the 20th century
  to the beginning of the 21st century, the western
  globalized culture originally conceived in the USA
  has been the most influential in the world, largely
  sidelining or assimilating other cultural groups
  through commercial, ideological, and to a less
  successful degree military means (Zallo, 2011).

- As of the start of the 21st century, that apparent
  cultural hegemony is rapidly being challenged, as the
  nascent eastern globalized culture, born from the
  union of Chinese culture with part of the western
  globalized culture, is quickly consolidating its
  dominance over many developing countries that have
  chosen China as their role model for modernizing
  their countries (González, 2021), (Stokel-Walker,
  2020), (William Yang, 2018).

- There are significant differences between both
  globalized culture models, both in regards to their
  core values and the way they propagate to other
  cultures. Western globalized culture is based on the
  culture of the United States of America. It
  propagates mostly through commercial and mass media
  exchanges. In contrast, eastern globalized culture,
  which is currently being formed from the union of
  contemporary Chinese values with the economic aspects

of western globalized culture, expands through
ideological, commercial, and technological
exportation to developing countries that perceive
china as a role model for their success (Zallo,
2011), (González, 2021), (Stokel-Walker, 2020),
(William Yang, 2018).

- Both globalized culture models heavily use
  information and communication technologies to
  propagate and function. The internet, social
  networks, and smartphone devices are critical aspects
  of both of them (Zallo, 2011), (González, 2021),
  (Stokel-Walker, 2020), (William Yang, 2018).

- Both globalized cultures go to great lengths to try
  to merge the physical world with the digital realm,
  creating a hybridized reality that largely gamifies
  everyday life and social interactions, trivializes
  happiness through the use of instant gratification
  techniques, and conducts ideological opinion through
  algorithmic information control. This intertwining is
  only expected to become more significant in the
  coming decades, as the emergent augmented and virtual
  reality technologies become more commonly used
  (Zallo, 2011), (González, 2021), (Stokel-Walker,
  2020), (William Yang, 2018).

- In western countries, the companies and organizations
  that provide and control these information systems
  have gained a lot of soft power as a consequence of
  creating them, largely bypassing and, in many cases,
  outright replacing the authority and influence that
  democratic governments have. In the east, these
  services are generally provided by governmentally
  sponsored organizations and corporations and
  effectively work as an extension of them. As a

consequence of this, the control that social media
organizations have over the population is less
inconspicuous in the east than in the west (Zallo,
2011), (González, 2021), (Stokel-Walker, 2020),
(William Yang, 2018).

- The main differences that can be found between western
  and eastern globalized cultures are rooted in the
  differences already present in the most predominant
  western and eastern philosophies and religions. The
  relationship that the individual has with the rest of
  society, both outward and inwards, defines those
  differences (Zallo, 2011), (Patil, 2020).

- In the east, the individual is fundamentally
  subordinated to society to guarantee harmony and
  collective well-being. In contrast, in the west,
  individuality and independence are thoroughly
  encouraged, even if it comes at the cost of the rest
  of society. In the East, ethics are based on the
  concept of shame, whereas in the West, they are based
  on guilt (Patil, 2020).

- In regards to the self-determination of the
  individual as analyzed from the point of view of the
  Self Determination Theory, both culture groups give a
  somewhat similar level of importance to the
  individual. Still, in the west, the achievement of
  competence plays a more significant role than in the
  east (Nalipay, King and Cai, 2020).

- While historically, tradition has been a significant
  aspect of both Eastern and western cultures, it has
  always had a more substantial influence in eastern
  ones. This means that eastern nations are generally
  having a more challenging time when it comes to
  adapting their population and economies to the

societal changes and challenges brought forth by the
new emerging technologies. The exception to that rule
is China because their government is doing its utmost
to redefine the entirety of their society and culture
into a new model that combines their traditional
values with the usage of emerging technologies. This
is transforming the contemporary Chinese culture into
the dominant eastern culture and allows it to grow
enough to become a form of globalized eastern culture
(Patil, 2020).

- Another significant difference between the two
  culture models is rooted in the difference between
  the eastern and western religions. As eastern deities
  have usually lacked the omniscient and ever-judging
  nature of western ones, eastern cultures have had
  more difficulties when assuring the constant
  compliance of law and order. As this problem is
  exacerbated in nations that have a very significant
  population size, those that embrace the usage of the
  new emerging technologies, like china, are attempting
  to recreate the ever-present control over the
  individual brought forth by the cultural philosophy
  of omniscient deities with complex information and
  surveillance systems (Patil, 2020).

- In any case, the weakest aspect of the emergent
  eastern globalized culture is its educational system.
  The development and utilization of new emerging
  technologies and social models require innovation,
  and innovation, by definition, requires the
  encouragement of critical thought, creativity, and
  ideological debate. Traditionally, those aspects have
  always been a core part of western education. In
  contrast, eastern educational systems have tended to
  prioritize forming capable individuals who comply

with the general rules of their societies, at the
expense of creativity and independent thought. As a
consequence, eastern nations are now facing a very
difficult choice: they either choose to keep
restraining critical thought in their educational
systems at the cost of innovation, potentially
causing them to fall behind in the technological
race, or they choose to encourage it to facilitate
the emergence of innovative ideas, which could
potentially lead the new generations to question the
nature of the governments that control their
societies (Zallo, 2011), (González, 2021), (Stokel-
Walker, 2020), (William Yang, 2018).

- For similar reasons, the innate innovative nature of
western cultures is their strongest point in the face
of the emerging eastern globalized culture (González,
2021).

- Because of their ideological differences and
commercial nature, it is only a matter of time until
these two culture groups clash with each other on a
large scale, redefining the cultural balance of the
world (Zallo, 2011), (González, 2021), (Stokel-Walker,
2020), (William Yang, 2018).

- National cultures are being progressively assimilated
by one of these two globalized culture groups. In
regards to western globalized culture, this process
only seems to care for those cultural aspects that are
interesting in a commercial way, as only the more
superficial features of national cultures seem to be
integrated into the broader globalized culture. On the
other hand, eastern globalized culture is becoming way
more imposing than its western counterpart, as it seems
more interested in outright replacing the national

cultures it enters in contact with than trying to
assimilate them into a larger and way more diluted
form. In any case, both globalized culture models
greatly contribute to the increasing decay of cultural
and ideological diversity (Watson, 2020).

5.4.2.3 Alternative Cultural Movements

Research and hypothesis

- It appears that globalized culture has managed to
  assimilate the most prominent alternative cultural
  movements of our time. An example of this would be the
  assimilation of socially progressive cultural movements
  into the globalized *Woke* and *Cancel* cultures (Leontyev
  and Leontieva, 2020)[10.4.1.9], (Attar, 2020).

- In the first decade of the 21st century, a cultural
  movement known as Alter-Globalization was formed with
  the goal of creating a new form of culture based on the
  most positive aspects of globalized culture, mainly its
  permeability and universality, but that would have
  rejected its most negative ones. Unfortunately, as a
  consequence of the emergence of social networks and
  digital mass media consumption, this movement fell into
  obscurity [10.4.1.9], (Attar, 2020).

5.4.3 Which ones are the gaps my research is trying to fill?

5.4.3.1 Culture of the information age

Gaps

- It is extremely troubling that the International community has not taken any significant action to prevent the loss of cultural diversity and uniqueness in the face of the proliferation of globalized culture, a problem that the rise of digital social networks has only exacerbated.

- It is also troubling that no significant attempt has been made to limit the influence that digital social networks have on the general population, especially regarding the younger generations, as this poses a serious threat to both the phycological health of individuals and the legitimacy of democracy.

- The trivialization, infantilization, and commercialization that social and environmental issues have suffered in the last two decades at the hands of social media cultures also go largely unnoticed. This severely limits the effectiveness of the actions taken to solve these issues, which could eventually have terrible consequences.

- With this research, I'll try to conceptualize an alternative to both the conventional social network systems and the culture they create and promote: a new model of interdisciplinary emergent networks based on the structures found in natural neural networks and evolutive emergent behaviors.

- Conceived as a cultural, artistic, informative, and academic environment based on humanist values, it will be my objective to design it in a way that

would, among many other things, permit the preservation of unique individual cultures, foster the creation of new unique cultures, and ultimately help shape a non-imposing form of universal human culture.

5.4.3.2 Western and Eastern Cultures, differences, and Globalization

Gaps

- Practically all the studies that study the emergence of the globalized eastern culture theorize that a confrontation between the eastern and western culture models is inevitable. My research will try to explore how both models could learn to coexist and benefit each other apart from commercial means.

5.4.3.3 Alternative Cultural Movements

Gaps

- In essence, my idea for fostering the emergence of a new form of culture based on the creation of a social network inspired by the structures found in natural neural networks and emergent behaviors is in itself the proposition for an alternative cultural movement.

5.5 Contemporary Art
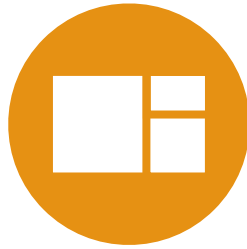
This section of the literature review is dedicated to studying 21st-century Art and explores its origins, contemporary state, and expected evolution regarding the future. To accomplish this, this section is divided into two subcategories: one dedicated to analyzing the contemporary art world, and a second section focused on studying the relationship between contemporary art and emerging technologies.

Art of the 21st century

- In this section, I analyze the nature of Art in the 21st century, in regards to its origins, its actual state, and its expected evolution.

Art and the emerging technologies

- In this last section, I analyze the relationship between art and technology, giving special attention to the possibilities and challenges opened up by the new emerging technologies.

5.5.1 Which ones are the Key Papers, Authors, and Works?

5.5.1.1 Art of the 21st century

Researchers

- In order to understand how the Art of the 21st century came to be, I choose the studies conducted by *Hal Foster* about the nature of artistic pluralism as a point of origin, as they offer an interesting late 20th century perspective in regards to how a pluralism at the service of cultural globalization and commodification could eventually lead to the dilution of Art (Foster, 1995).

- Then, I focused my attention on the work conducted by *Don Thompson* in regards to studying the economics of early 21st century Art. These studies, codified in the book titled *The $12 Million Stuffed Shark: The Curious Economics of Contemporary Art*, explain in great detail how the postmodern movement was transformed by the markets, making it embrace the very aspects and functions it was set to criticize: the excesses and absurdity of the high-level speculative Neo liberal economics (Thompson, 2010).

- Then, I focused on another of the studies conducted by *Foster*, a continuation of his early work that was codified in *Bad New Days*, a book that explores the nature and pitfalls of the art world of the 2010s (Foster, 2015).

- From this point onwards, I focused on analyzing multiple third-party studies and articles that explore the nature and expected evolution of the art of the 21st century.

Relevant papers and works

- The article published by *Hal Foster* in regards to the potential dangers associated to the proliferation of artistic pluralism at the service of cultural globalization and commodification, titled (Bridgestock, 2021).

- The book published by *Don Thompson* in regards to the dilution of the post-modern movement titled *The $12 Million Stuffed Shark: The Curious Economics of Contemporary Art* (Thompson, 2010).

- The book published by *Hal Foster* in regards to the nature of the art of the 2010s, titled *Bad New Days Art, Criticism, Emergency* (Foster, 2015).

- The articles published by *Sylvain Levy* in regards to current challenges faced by contemporary art, titled *The Challenges Facing the Art* World Today and *What is a museum today?* (Bridgestock, 2021) (Levy, 2019), (Levy, 2018).

- The article published by *Barry Schwabsky* in regards to the challenges faced by contemporary professional artists, titled *What Are Art Galleries For?* (Schwabsky, 2020).

- The book published by *Jiang Jiehong* about the state of contemporary art in china, titled *The Art of Contemporary China* (Jiehong, 2021).

- The book published by *Charles Saatchi* in regards to his work as an art collector, investor, and patron, titled *My Name Is Charles Saatchi And I Am An Artoholic: Everything You Need To Know About Art, Ads, Life, God And Other Mysteries And Weren't Afraid To Ask* (Saatchi, 2009).

- The article published by *Devon Van Houten Maldonado* in regards to the probable future of art, titled *What will art look like in 20 years?* (Maldonado, 2019).

- The article published by *Annabelle Steffes-Halmer* in regards to art censorship in china, titled *Hong Kong's new M+ museum accused of censorship* (Steffes-Halmer, 2021).

- The article published by *Henry Ergas* in regards to the submission of museums to political correctness, titled *Trying to redefine museums: a disease of our times* (Ergas, 2019).

- The article published by *Hedonova* in regards to the evolution of art investment, titled *Invest in fine art worth millions* (Hedonova, 2020).

5.5.1.2 Art and the New Emerging technologies

Researchers

- As this section is directly linked to the already analyzed emerging technologies of our time, most of the literature that concerns it in a contextual manner has already been explored. Therefore, in this section, I'll focus on analyzing third-party articles that explore the topic.

Relevant papers and works

- The article published by *Andrew McWilliams* in regards to the value of the point of view of artists in the development of emerging technologies, titled *How artists are reshaping emerging technology research* (McWilliams, 2018).

- The article published by *Wired* in regards to the relationship between artists and emergent information technologies, titled *The Future of Art* (*Wired*, 2018).

- The article published by *Margherita Concina* in regards to Virtual Reality Art, titled *Immersive Technology: The Future of Art* (Concina, 2021).

- The article published by *Ramón López de Mántaras* about the relationship between Art and Artificial intelligence, titled *Artificial Intelligence and the Arts: Toward Computational Creativity* (López de Mántaras, 2020).

- The article published by *Mitchell Clark* in regards to NFT-based digital art, titled *NFTs, explained* (Clark, 2021).

- The article published by *Viktoria Modesta, Neil Harbisson, and Amal Graafstra* in regards to the utilization of genetic and cybernetic engineering in Art, titled *How technology is changing what it means to be human* (Modesta et al, 2020).

- The article published by *Alice Fleerackers* about Art in the age of biotechnology, titled *Art's Work in the Age of Biotechnology* (Fleerackers, 2020).

- The book published by *Michell Serres*, titled *El Paso del Noroeste* (Serres, 1991).

- The article published by *Nir Hindi* about the value of the artistic mindset in business-related decision-making, titled *An Artistic Mindset Is Fundamental for Business Leaders* (Hindi, 2020).

5.5.2 Which ones are the key theories and hypotheses?

5.5.2.1 Art of the 21st century

Research and hypothesis

- Much of what defines the Art of the early 21st century has its roots in the late post-modern and pluralist movements, but, dissimilarly to the artistic movements that characterized the 20th century, it would be more appropriate to say that contemporary art can be considered more a mutation of its precedents propitiated by social and economic factors, than an antithetical or synthetic evolution. I have come to this conclusion after analyzing and comparing the studies published by *Hal Foster* and *Don Thompson,* as the former's work offers an exhaustive critical overview of the evolution of the artistic disciplines in the first two decades of the 21st century, while the later's work, codified in the book titled *The $12 Million Stuffed Shark: The Curious Economics of Contemporary Art,* explores the excesses and absurdity of contemporary art related economics (Foster, 1995), (Foster, 2015), (Thompson, 2010).

- Based on the analysis conducted by Foster and Thompson, we can determine that the identity of 21st-century art was forged from the dilution and combination of the late post-modern postulates and artistic pluralism, especially regarding their apparently critical but ultimately submissive relation toward Neo liberal ideals and the globalized culture. The result of this process was the conception of an artistic environment defined by a lack of orientation, originality, coherence, and initiative, an environment in which all voices are treated with the same amount of apparent

significance, at the cost of criticality and in favor
of social and economic convenience (Foster, 1995),
(Foster, 2015), (Thompson, 2010).

- As Foster points out, one of the most significant
pitfalls of contemporary art is its dismissal of true
criticality. On the one hand, it is a defining
characteristic of contemporary art to accept any type
of artistic form as valid as long as it is morally
aligned with what is determined by public opinion, a
behavior that leads to a devaluation and dilution of
the artistic disciplines. On the other hand, it is
common among contemporary artists to be critical of
the work of other artists, mainly because globalized
culture encourages senseless competitiveness among
them, but it is increasingly rare to find an artist
that would apply a critical lens to their own work.
Put together, these two aspects define a hyper-
competitive artistic environment in which everyone
wants to say something, but only dares to say what
the others are already saying (Foster, 2015).

- In theory, as Foster points out, contemporary art
concerns itself with criticizing the more prevalent
social injustices of our time and aspires to express
itself in a way that encourages social participation
and activation, with the goal of driving positive
social change. In practice, however, the prevalence
of cultural globalization and mass media truncate
that objective, as society has interiorized the
nature of those social injustices in such a distorted
way that the mere participation in anti-injustice
social events calms their conscience, keeping them
from taking any real action. This same behavior
applies to the artists themselves, as the distorted
perception of reality they are used to makes them

190

assume that the mere act of pretending to care about the injustices of the world is the same as actually taking action against them (Foster, 2015).

- As a consequence of that lack of criticality caused by the influence of globalized culture, innovation and originality are largely sidelined in favor of creating works that are aligned with public opinion. Contemporary artists tend to create works that are either similar to what others around them have already created, as this is more convenient and shields them from potential moral criticism, or that are based on the work conducted by previous art movements, especially those related to social critique and the interaction between the public and the artist. In the end, most contemporary works of art mimic what is already proven and accepted as a form of art by the globalized society, taking the late 20th century social and post-modern art movements as a basis, without displaying any type of regard for criticality and actuality (Foster, 2015).

- That reverence for the late 20th-century social art movements is born from the perceived function of contemporary art as a social change instigator. Particular attention is given to performative and participative art with the pretext that their apparent capacity to shorten the gap between the artist and the spectator can increase the social impact of an artwork. Although this behavior makes sense in theory, it doesn't work out in practice. As Foster explains, unlike their 20th-century counterparts, contemporary spectators fail to be engaged by even the most participative forms of art because of the influence that mass media and globalized culture have on their personalities.

However, as that influence distorts the perception of reality up to a point in which mere apparent participation is confounded with true action, most contemporary artists tend to be content with the result of their works, falsely believing that they have contributed to social change in a positive way (Foster, 2015).

- That very same preference for participative art tends to compromise the quality of contemporary artworks, as not an insignificant number of artists tend to leave their works only partially completed with the intention of letting the spectators participate in their completion. As Foster indicates, this only decreases the artistic value of said works and devaluates the artistic disciplines as a consequence. Even then, not all forms of participatory art fall into this category (Foster, 2015).

- Foster also explains that many contemporary artists focus their attention on studying the nature of the information and communication technologies that permeate much of the developed world. In most cases, these artists try to create works that serve as a cynosure or nexus between the information technologies and the spectator, with the goal of encouraging a more conscious use of them. Ultimately, however, and much like in the case of performative and participative art, the very influence of mass media keeps the spectators from forming any kind of meaningful connection with these artworks (Foster, 2015).

- In Short, Foster believes that there is little that contemporary art can do to conduct an impactful social critique, as a consequence of the influence of

mass media and globalized culture, from a
downhearted, if realistic, point of view. The common
spectator perceives contemporary art as a curiosity
or a form of extravagant entertainment while
perceiving artists as picturesque individuals at
best, or useless slackers at worst (Foster, 2015).

- This commentary made by Foster is further supported
by an analysis conducted by the art collector *Sylvain
Levy*, who, after discussing the state of the
contemporary art world with the students of the
Sotheby's Institute, concluded that one of the most
significant challenges that art is facing today is
the way the globalized cultural consensus is
assimilating it. Levy argues that one of the most
defining characteristics of art resides in its
capacity to exist apart from the social consensus and
that by accepting and becoming a part of that
consensus, artists are devaluating the critical value
of art in a very significant way. Much like Foster,
Levy links the submission of art to the globalized
social consensus to the emergence of mass media and
social networks, signifying the latter's capacity to
directly influence the perceptions and aspirations of
the artists themselves (Levy, 2019).

- Then, Levy moves to analyze the nature of the
economics of the contemporary art world, pointing out
that its extreme polarization is the other most
significant challenge that art faces today. On one
side of the spectrum, we can find the vast majority
of individuals who directly contribute to the
artistic world, from professional artists to everyday
curators, writers, and cultural workers, individuals
who play a crucial role in creating and maintaining
the artistic ecosystem, but that are, more often than

not, extremely underpaid for their work. On the other
side of the spectrum, we find art investors, auction
houses, and superstar artists, the individuals that
accumulate most of the monetary wealth generated by
contemporary art but that at the same time contribute
the least to the cultural aspect of the art world
(Levy, 2019).

- Levy argues that this economic polarization has only
  been able to reach its current extreme thanks to
  social networks, as they allow artists to bypass the
  more traditional economic structures of the art
  world, making art galleries largely obsolete in the
  process. As a consequence, the younger generations of
  artists are almost solely focused on creating
  artworks that are not only accepted, but adored, by
  the globalized social consensus that permeates the
  social networks in a desperate attempt to gain social
  recognition and, perhaps, a chance to be chosen by
  the investing elites as the next big thing (Levy,
  2019).

- The economic nature of artworks themselves has also
  changed drastically in the last three decades. As
  Levy indicates, up to the late 80s, the overall
  monetary value of artworks was static throughout the
  life of an artist, which meant that investors could
  not expect to make a quick profit from investing in
  art outside of some edge cases. However, with each
  decade that has passed since then, and especially
  after the decay of postmodernism and the emergence of
  social networks and mass media, the monetary value of
  artworks has become way more volatile, which drives
  investors to not only speculate on art but to rig the
  system in their favor as if it was any other
  commercial venture (Levy, 2019).

- It was in the intermediate phase that elapsed between these two points that the investors started to gain their influence progressively, with a very significant milestone being achieved in the later years of post-modernity: the codification of the concept of the artist superstar as a brand, exemplified in the carers of artists like Jeff Koons and Damien Hirst. Especially in the case of Hirst, whose rise to stardom was propitiated by the businessman and art collector Charles Saatchi, it is easy to identify this process: an investor chooses an artist who is renowned within their community but not known outside of it, then the investor finances the artist and only receives some of the produced artworks as compensation, then the investor turns the artist into an international superstar by buying the opinion of renowned art critics and collectors, and in the end, the investor collects the fruits of their work by selling the artwork they had been given in exchange for patronage for an exorbitant amount of money. The artist ends up being a rich superstar, and nothing else (Saatchi, 2009), (Thompson, 2010).

- Although Saatchi undertook his patronage of Hirst mostly in an experimental way and did not even make that much of a profit out of Hirst's artwork following a mysterious fire in which he lost most of the artworks he had collected from him, he did codify the process of transforming an everyday professional artist into an international superstar as a form of speculative investment, even if said speculation could arise significant legal reprimands (Saatchi, 2009), (Thompson, 2010).

- In the last decade, that process has been streamlined thanks to the proliferation of social networks.

Nowadays, it is investors who, with the only goal of making a profit, determine what art form is trending and which previously unknown artists are to become the next international superstar. Thanks to the anonymity allowed by the social networks and the cultural malleability provided by the globalized culture, they can usually influence the system in such an indirect way that they are almost entirely immune to social or legal repercussions. In this scenario, artists and artworks alike are treated as mere commodities, devoid of any actual cultural value. Gallerists, art critics, curators, art fairs, and even auction houses do not fare better, though, as their function regarding the new state of the art world is to fulfill a mere intermediary role that is almost always subordinate to the will of the investors, a role that in many cases burns them out or progressively makes them obsolete (Levy, 2019).

- And what happens with those who are not chosen to be international superstars? With the vast majority of professional artists? The current economic situation of the art world leaves little room for those who try to think independently or attempt to create something that is not aligned with the postulates set by the globalized culture, which means that artists are either forced to enter the game set by the investors or risk their fall into irrelevance. Even then, most professional artists nowadays can not expect to make a living out of their work and are almost always forced to collate their artistic careers with other jobs. This has become way more apparent in the pandemic-defined world, as the restructuring of society has further contributed to the

commodification and insulation of the art world (Levy, 2019), (Schwabsky, 2020).

- In this scenario, art galleries are progressively falling into complete irrelevance, in grand part thanks to the prevalence of social networks. Similarly, museums and art centers are being transformed into mere socialization spaces. Moreover, many contemporary museums are embracing the rewriting of history at the service of political correctness as one of their new defining characteristics. This behavior can be considered a complete betrayal of their neutral conservative function. However, if we consider that many museums depend on governmental and private sponsorships to remain profitable, it is very likely that they will not be able to avoid being completely assimilated by the globalized culture (Foster, 2015), (Schwabsky, 2020), (Levy, 2018), (Ergas, 2019).

- In the end, Hal Foster indicates that, as there is nothing that contemporary art can do against the globalized culture, what remains for independent thinking artists to do is to conduct their work as a way to expose actuality, and to do so in a way that is at the very least honest and critical with themselves. Then, Foster identifies a series of aspects that would be key in the creation of this type of art: the elaboration of a personal and well-defined **aesthetic** that is true to oneself, the conduction of the artistic process in a **cognitive** way that bridges reason and emotion, and the implementation of **criticality** in the whole procedure, both towards oneself and the outside world. If, after following those steps, the artist manages to take into consideration the past, present, and probable

future of their reality in a relatively unbiased, if subjective, way that is independent of the globalized cultural consensus, they would have managed to create an artwork that is honest to its creator, and that manages to expose actuality (Foster, 2015, p. 140-155).

- In that scenario, galleries and museums could play a key role in generating a space that permits the emergence of actuality-focused art. Galleries could be redefined as physical spaces separate from the globalized media where independent thinking artists focused on capturing actuality could exhibit their work in a relatively safe, if isolated, way. Museums could focus their resources on preserving actuality through history in a neutral way, serving as a way to counter the rewriting of history in the name of political correctness. However, if we consider what we have already discussed about galleries and museums, this idea might come up as overly optimistic (Foster, 2015), (Schwabsky, 2020), (Levy, 2018), (Ergas, 2019).

- However, all seem to point out that regarding the foreseeable future, the art world will continue down the path it has been following since the beginning of the century, something that can be easily perceived by analyzing articles and interviews that explore the topic. Most curators and new generation artists around the world seem to agree that inclusivity, activism, participation, and the utilization of the new emerging technologies will play key roles in defining what the art of the near future will try to be: a tool for collective expression, social critic and participation, not a subjective and individual venture (Maldonado, 2019).

- We can also expect a sift from the current anglo-
  centric artistic landscape to a more culturally
  inclusive one in which the cultures belonging to
  emergent nations have a more prominent role. China's
  role in the future of art should not be
  underestimated either. However, it would be more
  appropriate to say that this nation's influence
  concerning the art world may come more from its
  attempts to export its culture and values to
  developing countries than from a genuine interest in
  art. What's more, the Chinese government has made
  clear many times already that it will not tolerate
  any form of art that contradicts its version of
  history and reality, something that can be easily
  perceived in the way they censor the works of
  dissident artists like Ai Weiwei and Kacey Wong
  (Maldonado, 2019), (Jiehong, 2021) (Steffes-Halmer,
  2021).

- All in all, although it can be said that this newer
  generation of artists and culture workers do probably
  have their hearts in the right place (the development
  of art as a form of social criticism that drives
  positive social change), if we consider Hal Foster's
  and Sylvain Levy's interpretation of the current
  state of the art world, we can then theorize that
  this path will only manage to exacerbate the dilution
  of the artistic disciplines and the polarization of
  art economics. As it is becoming increasingly evident
  that art can do little against the influence of
  cultural globalization and social media, independent
  thinking artists may have no choice but to return to
  a more intimate and personal form of art for the
  foreseeable future. Eventually, the future itself
  might bring the solution to this conundrum, as the

new emerging technologies might end up shaking the workings of society enough for art and culture to become real and relevant again (Foster, 2015), (Levy, 2019), (Maldonado, 2019).

5.5.2.2 Art and the New Emerging technologies

Research and hypothesis

- To conduct this analysis, it is essential to consider the nature of the relationship between art and technology. Art has always had a very intricate and symbiotic relationship with technology, with art being a catalyst for innovation and a source of inspiration to technology, and technology being a tool and a creative spectrum for art. In many ways, it can be said that both art and technology have been essential for the development of each other throughout our history, and it would be naive to think otherwise. Therefore, if we consider the unprecedented amount of opportunities and challenges that the new emerging technologies will bring fort through the next decades, we can easily foresee that art as a discipline could change drastically in the immediate future and that the artistic mindset could be vital in helping develop these technologies sensibly.

- First, let's examine the multiple ways the new emerging technologies could revolutionize art. To be frank, each one of them could potentially alter the artistic landscape in a radical way. However, it is their combined and unrelenting potential for change that will more than likely redefine art, both in direct and indirect ways. The new emerging

technologies will drastically alter how we perceive
ourselves and those around us, they will redefine how
we understand and interact with the world, and are
more than likely going to make most of our
contemporary social and economic structures obsolete.
They will change what it means to be human, what it
means to be alive and conscious, and what reality
entails. Most of all, however, these changes will
more than likely unfold in such an accelerating and
unrelenting way that most individuals won't be able
to properly perceive, and much less adapt, to the
changing world without suffering some kind of
emotional and social trauma. It is at this crossroads
where, in tune with the postulates of Hal Foster and
Joseph Alberts, art could play the critical role of
codifying actuality from a personal and individual
perspective, serving as a way for humanity to find
its bearing, a way for individuals to bridge reason
and emotion together so that we can overcome the
challenges of the future (Keough, 2013), (Foster,
2015).

- A notorious, if infamous, emerging technology that
  has cached the attention of the contemporary art
  world is that of the cryptocurrency-powered *Non
  Fungible Tokens*. In theory, NFTs can be used to
  create professional digital artworks that can not be
  easily replicated, but in practice, they offer no
  tangible advantages over conventional digital signing
  systems. If we account for the current state of the
  art world as portrayed by Hal Foster and Sylvain
  Levy, it is no surprise that NFTs are already being
  used to create overpriced digital artworks in the
  service of economic speculation. If the utilization
  of NFTs continues unregulated for long, we can only

expect that the cultural value of the artistic disciplines will be devaluated significantly (Foster, 2015), (Levy, 2019), (Clark, 2021).

- Nevertheless, when it comes to the immediate future, we cannot expect any other emerging technology to have as much of an impact on art as those related to Artificial Intelligence, both in direct and indirect ways (López de Mántaras, 2020).

- The most immediate, obvious, and direct utilization of AI systems in the art world will come from the creation and use of ANI-based creative tools, and computer programs that will utilize automation, machine learning, and deep learning technologies to expand the creative capacities of artists greatly. On the one hand, ANIs will allow artists to create artworks in highly innovative and experimental ways; on the other, ANIs will be utilized to automate many of the most repetitive processes associated with the creative process, allowing individual artists to perform the work that nowadays would require the collaboration of entire teams (Nigel Wright Group, 2018), (López de Mántaras, 2020).

- The most rudimentary of these systems are already being utilized to create artistic tools. They already allow for the encoding and recreation of artistic styles in a mostly automated, if still largely abstract, manner. These tools range from the more experimental tools, like the ones created by the Open Ai group, to the more commercial ones, like WOMBO's *Dream* application or Dungeon Ai's interactive story generators. The complexity of each of these tools, and the level of abstraction of the artworks and pieces they manage to create vary extensively from

program to program, but because of the nature of Machine learning and Deep learning based ANI systems, we can expect that their fidelity and usability will only become more significant as time goes by as more complex forms of these programs are created and more people start to use them (Open Ai Group, 2021), (López de Mántaras, 2020).

- In regards to the direct impact of automation on the art world, we can expect that the most significant change it will bring forth will be its capacity to ease the workload necessary to complete creative tasks throughout the entirety of the artistic disciplines. From realizing conceptual studies, to modeling and animating conceptual 3D models or composing entire soundtracks, automation will allow individual artists or small creative groups to complete projects that nowadays would require the active participation of entire creative studios. This, being a boon for small production teams and large groups alike, could potentially increase the artistic and cultural output of contemporary society in an unprecedented way, and would serve as a way for small independent studios to compete with the output of large-scale commercially oriented creative ventures (Granta, 2017),(López de Mántaras, 2020).

- However, what is important to reiterate is that ANI systems are just computer programs and tools, not sentient beings. Consequently, any artwork they create can only be attributed to those who utilized the ANI system, in the context in which they used them. A painting created by an ANI system in the style of Rembrandt is just the interpretation made by a deep learning program of Rembrandt's creative style, nothing more (López de Mántaras, 2020).

- However, when we start to talk about the implications of General Artificial intelligence in regard to the art world, things change substantially. As AGIs would be fully intelligent and self-aware beings, it would only be logical to treat them as independent individuals capable of being artists themselves. Because the mind and phycology of a quantum AGI would more than likely be radically different from our own, we can only speculate about what sort of artworks they would create (Dilmegani, 2021), (López de Mántaras, 2020).

- After Artificial Intelligence, the emerging technologies that will have the most significant impact in the art world in regard to the foreseeable future are those related to information, communication, system networking, and digital environment generation, chief among them being Augmented Reality and Virtual Reality technologies, what many denominate the Immersive Technologies (Marr, 2021), (Weiner, 2018), (Concina, 2021).

- From those two, Augmented Reality is already unfolding in the world in a significant manner, and, as I previously explained on its own topic, it is expected to almost entirely take the place of modern Smartphone based communication and interaction technologies by the end of this decade. As AR will essentially merge the information and physical realms into a seamless experience, artists will finally be able to create artworks that are attuned to the nature of information in an immersive way that exists in the physical and digital world at the same time (Marr, 2021), (Weiner, 2018), (Concina, 2021).

- In practice, AR will introduce an entirely new medium for artists to develop their work because, even if it is more than likely going to have many similarities with contemporary technological art, its immersive nature will be too impactful not to take into account. Nevertheless, we can expect that most contemporary artistic disciplines will find their way into AR and that, in many cases, new redefined versions of them will be created in the new digital environment (Marr, 2021), (Weiner, 2018), (Concina, 2021).

- We also have to account for the plethora of digital tools and creative environments that AR will make possible, which will benefit practically all the artistic disciplines, especially when paired with Artificial Intelligence technologies. For example, AR will allow Architects to visualize and experience their buildings in an immersive way while designing them (although the full exploration of the structures will only be possible through Virtual Reality), and it will make it possible for painters and sculptors to create HUD projected digital guidelines to steer their work, and will make possible for art galleries and museums to plan exhibitions in great detail in advance to the arrival of a particular artwork or collection (Marr, 2021), (Weiner, 2018), (Concina, 2021).

- However, there is one very significant potential risk associated with the proliferation of augmented reality technologies, as their use becomes more common, society will start to neglect the aesthetics of the real world. This process, if left unchecked, could eventually lead to function ruling completely over form in regards to the aesthetics of the physical world. While this eventuality might be unavoidable, and in many cases even desirable from a

resource consumption point of view, it will also
provide the artist and artistically minded
individuals with a new venue for their work, as
artistic groups such as the Bauhaus have already
proved that art can bridge function and form in ways
that are both practical and beautiful (Marr, 2021),
(Weiner, 2018), (Invaluable, 2019), (Concina, 2021).

- In regards to Virtual Reality, we can expect that in
the short term, it will have an impact on the art world
not too dissimilar from the one we can expect from
Augmented Reality, with the main difference being
that, while AR is focused on merging the physical and
digital dimensions, VR tries to create entirely new
digital environments that are immersive and potentially
indistinguishable from the physical world. Eventually,
VR will allow us to create an entirely new dimension of
interconnected digital realms that we will be able to
access and experience in an immersive way (Marr, 2021),
(Eisenberg, 2018), (Folgen, 2021), (Concina, 2021).

- VR already allows artists and cultural workers to
utilize many innovative digital tools in an
unprecedented immersive manner, proving to be
especially useful for the architectonical and
conservational disciplines. However, because of the
relative cumbersomeness of the devices necessary to
utilize VR, its usage by professional artists is not
yet widespread. In the coming decades, as VR devices
become more streamlined and potent, we can expect
that their use will expand rapidly though the entire
artistic community (Marr, 2021), (Eisenberg, 2018),
(Folgen, 2021), (Concina, 2021).

- The main promise of VR resides in its potential to
create entirely new realities that are as immersive

as the physical one. This dream could only become
true if we manage to create devices or implants that
can directly feed a complete set of high-fidelity
artificial sensorial stimuli directly into the brain.
Even if we don't manage to develop those systems, the
more advanced forms of conventional VR would still
prove to be revolutionary for most artistic
disciplines, as they would allow artists to give
shape to fully immersive virtual environments down to
the last detail, from their basic structures and
physical laws up to their appearance and content. As
of now, we can only make conjectures about what sort
of art could emerge within the realm of fully
immersive VR, but we could easily define it as
reality shaping (Marr, 2021), (Eisenberg, 2018),
(Folgen, 2021), (Concina, 2021).

- Of course, we also have to account for the most
  significant risks associated with Virtual Reality,
  chief among them beings its potential to fully
  enthrall individuals with the promise of perpetual
  escapism, a popular, if pessimistic, theory that is
  commonly found in the science fiction literature and
  media that explores the concept of VR. In this
  regard, we can already say that it will likely be up
  to culture to promote responsible use of VR. However,
  if the current globalized cultural trends continue
  unchallenged, culture's influence might cause more
  harm than good. This is why it will be essential for
  the future of our species that independent and
  critical thinking individuals, counting among them
  the artistically inclined, give shape to alternative
  and more authentic VR realms that are separate from
  the mainstream ones (Marr, 2021), (Eisenberg, 2018),
  (Folgen, 2021), (Concina, 2021), (Lavoie et al, 2021).

- The other most important risk associated with VR resides in its unprecedented capacity to directly affect the mind. A Virtual Reality that is too traumatic or bizarre could very negatively affect the mind of anyone who would experience it. While this is true for any type of VR utilization, it is way more relevant in what concerns the artistic applications of the technology because of the experimental nature of art. In order for VR art to completely develop, it will be essential to approach its development in a very cautious manner (Marr, 2021), (Eisenberg, 2018), (Folgen, 2021), (Concina, 2021), (Lavoie et al, 2021).

- Cybernetics is the next technology we have to account for in regard to the future of art and culture. Unlike Ai, AR and VR, cybernetics will be one of the emerging technologies that will allow humans to repair, modify and even augment the capabilities of their bodies. It is also significant to mention that cybernetics will allow us to enhance our senses so that we can directly interact with the digital realm with our minds, a prospect that, when paired with Ai, AR, and VR technologies, could further dilute the barriers between the physical and the digital. We won't really know how cybernetics will affect the art world until the general population starts using them. Even then, we can already theorize about what new opportunities and risks it will bring forth (Modesta et al, 2020).

- This technology will allow us to modify or even enhance our bodies by implanting cybernetic body parts into them. While modern-day cybernetics are not yet that advance, we can expect that in the coming decades, the technology will evolve enough to offer some groundbreaking artificial body parts that will

vary from complex bionic implants designed to replace damaged or lost body limbs, to artificial sensorial organs designed to enhance our capabilities, to even complex neuronal chips capable of augmenting our memory and intelligence. Most of all, however, cybernetics will allow us to completely embed technology into ourselves in a relatively seamless way, which means that, in practice, they will also allow us to embed art into our own bodies in both direct and indirect ways (Modesta et al, 2020).

- Because of the still experimental nature of the technology, we can not yet know how this type of art will develop. Nevertheless, we can theorize that it will more than likely be related to the concepts of cognition, body identity, and perception. In many ways, we can say that cybernetic art will have a lot in common with Ai, AR, and VR art and culture, as cybernetic themselves will work as a bridge between all those technologies and our bodies. Consequently, the dangers associated with those technologies will also apply to cybernetics and any form of art that could emerge thanks to them. Much like with VR, artists will have to approach their exploration of cybernetic art with extreme care, as an implant that is too bizarre for our brains to handle could permanently scar our minds. Even the unmoderated use of less complex implants could drastically change what a person is (Modesta et al, 2020).

- In regards to Genetic and Biological engineering, we can expect that its relationship with art will more than likely be similar in many ways to the one between art and cybernetics, with the main differences being that, on the one hand, genetic engineering will allow the artist to modify their

bodies in an unprecedented manner, it won't let them
merge the digital realm with the mind, and on the
other, it will theoretically make possible for
artists to create entirely new life forms as a form
of art, something cybernetics can not do. Of course,
if we consider the potentially dangerous applications
that Genetic engineering could have, we should not
expect that its most complex applications will be
available to the general population (Modesta et al,
2020), (Fleerackers, 2020).

- Ethics will more than likely play a key role in
  determining what artists will be able to do with
  Genetic Engineering technologies, especially
  regarding the hypothetical modification of existing
  lifeforms, or the creation of completely new ones
  (Fleerackers, 2020).

- Regarding the rest of the emerging technologies, their
  relation to the art world will mostly be indirect and
  thus do not require an in-depth analysis.

- Ultimately, however, one of the most, if not the
  most, significant changes that the new emerging
  technologies will bring forth to the art world will
  be an indirect one: as these technologies will more
  than likely make most contemporary economic and
  cultural postulates obsolete, the ensuing chaos will
  present the art world with an unprecedented
  opportunity to reinvent itself.

- There is, however, one last and very important aspect
  of the relation between the new emerging technologies
  and art that should be mentioned in this section: the
  value of the artistic mindset on itself, both as a
  catalyst to spark innovation and as a mediator
  between reason and emotion (McWilliams, 2018).

- Regarding the value of the artistic mindset as a catalyst for innovation, recent studies have demonstrated that the research groups that have incorporated artists or artistically thinking individuals into them, tend to develop their research in significantly more novel ways than those who don't. A recent study published on Thoughtworks pointed out that the inherent capacity that artists have to think outside the box, paired with their ability to foster interdisciplinary curiosity and development, and alongside their aptitude to bridge reason and emotion, makes them invaluable as researchers, especially if we consider that one of the most common behavioral problems found on contemporary research groups is that they tend to develop serious cases of tunnel vision in regards to their work (McWilliams, 2018).

- Therefore, a completely new professional venue is opening up for contemporary artists, one that will be directly linked to the creation of the technologies that will define our future and that will more than likely make it possible that the development of said technologies will be conducted in a more sensible and empathic manner that if they were developed exclusively by conventional research groups. In practice, the same approach could be taken in regard to most human disciplines (McWilliams, 2018).

- Similarly, many contemporary educators defend that the artistic mindset on itself should be imparted to the population as a whole, as such a mindset could be key for individuals to adapt to the sudden changes and challenges that the future will bring forth. This is a topic that I explore in great detail in the next section, dedicated to the concept of education.

5.5.3 Which ones are the gaps my research is trying to fill?

5.5.3.1 Contemporary art and technology

Gaps

- The main gap I have identified in regards to
  contemporary art is as follows: the contemporary
  state of artistic and the cultural world doesn't
  leave much room for independent thought and true
  criticality to emerge among artists, and while some
  theorists criticize this situation, there are no
  significant attempts, academic, professional or
  otherwise, to correct this situation.

- To counter that gap, my dissertation will mostly
  focus on proposing novel and sensible ways for
  artists to develop their identity and work in the
  face of extreme cultural globalization and the
  emergence of radically impactful technologies and
  global-scale challenges. To accomplish this, I will
  base my work on the studies conducted by Hal Foster
  and other art critics and scholars.

- In many ways, my work will more than likely pose a
  sensible departure from most contemporary globalized
  artistic postulates in defense of a more personal,
  intimate, and critical form of art inspired by
  Foster's idea on actuality: the development of a
  robust artistic style centered on capturing the
  artist's personal perception of actuality, defined by
  a concise unique aesthetic that is true to oneself,
  as well as by a synergy between the rational and
  emotional side of the mind, and a strong sense of
  criticality both in regards to the world and
  themselves.

- Ultimately, my study will propose that there is little that independent thinking artists can do to oppose contemporary globalized art and economics apart from developing their personal style and artworks as a form of refuge. Similarly, I will defend that there is little that contemporary culture workers and institutions can do to challenge the current state-of-the-art world.

- In the face of this grim pretext, I will present the society redefining the potential of the new emerging technologies as the force that will more than likely offer art a plethora of new opportunities to reinvent itself, as most contemporary economic and globalized cultural postulates will become obsolete as a consequence of the advent of said technologies. This is why I will reiterate the importance of technological knowledgeability in the art world, and the value of integrating independent thinking artists into the development of the new emerging technologies.

5.6 Contemporary Education and Academia

Education and academia are an essential part of any society, but it has become evident in the last decades that our current educational and academic systems are lagging behind when it comes to fostering technological and social progress. In this section, I'll review the literature I have found relevant to the study of this topic in the context of my dissertation.

Contemporary education and academia

- This section is dedicated to the contextual study of contemporary education and academia on a global scale.

New educational and academic models

- This part of the literature review focuses on studying novel postulates for educational and academic models, giving special attention to those that try to integrate the scientific, technological, and artistic disciplines into a single interdisciplinary system.

An artistic mindset for education

- This part is dedicated to the studying of educational and academic postulates that have an artistic mindset as a core pillar of their structure.

5.6.1 Which ones are the Key Papers, Authors, and Works?

In order to obtain an extensive yet concise overview of this topic, I have focused my attention on the studies conducted by a series of key authors, as well as on a series of third-party articles written about the topic. It has been given special importance to the history of educational systems and academia, their current state, and the evolutionary paths they may take from now on. It has also been key to analyzing the differences between western and eastern educational models.

5.6.1.1 Contemporary education and academia

Researchers

- In regard to my study of contemporary education and academia as a whole, I chose the Secular Humanistic Postulates as a core framework for my studies.

- In regards to western educational and academic models, I chose *Operating Manual for Spaceship Earth*, written by *Buckminster Fuller*, as the center-point of my research, as it provides an interesting overview of the evolution of hierarchical educational systems in western nations from antiquity to the present day (Fuller, 1969).

- In order to study the nature of eastern education, I studied *Ji Li's Cultural Foundations of Learning: East and West,* a book that explores the differences

between western and eastern academic models in great detail (Li, 2021).

- To analyze the educational and academic inequalities present in the contemporary world, I focused my attention on the *World Inequality Database on Education* created by *UNESCO*, which provides an insightful overview of the topic (UNESCO, 2021).

- Additionally, a series of articles written by third-party researchers provide an encompassing supplement to the research on this topic.

Relevant papers and works

- The Secular Humanists Postulates, as defined in 1980 by the *Council For Secular Humanism* (CSU, 1980).

- The book published by *Buckminster Fuller* in regards to the state of the human civilization and the planet Earth in 1969, titled *Operating Manual for Spaceship Earth* (Fuller, 1969).

- The book published by *Ji Li* in regards to the nature of Eastern and Western education and academia, titled *Cultural Foundations of Learning: East and West* (Li, 2021).

- The database created by the United Nations Educational, Scientific and Cultural Organization in regards to educational inequality, titled *World Inequality Database on Education* (UNESCO, 2021).

- The article published by *Laura Bridgestock* in regards to the cost of higher education in the USA, titled *How Much Does it Cost to Study in the US?* (Bridgestock, 2021).

- The study published by the *European Parliamentary Research Service* in regards to the relationship between art and technology through the history of our species, titled *The historical relationship between artistic activities and technology development* (EPRS, 2019).

- The study published by *Deanna Kuhn* in regards to the concept of the Scientific Mindset and its value for education, titled *What is Scientific Thinking and How Does it Develop?* (Kuhn, 2010).

5.6.1.2 New educational and academic models

Researchers

- In regards to the postulates for new forms of education and academia found among western nations, after reviewing the OECD's 2020 report on the future of education, I studied a series of articles that cover the concept of *STEM* education proposed by *Rita Colwell* and the *North American National Science Foundation,* as they offer an extensive overview of where current western academic models are heading. After that, I focused my attention on the dissertation conducted by *Georgette Yakman*, titled *STEAM Education Professional Development Practicum & Research*, as it explores the concept of integrating the arts into the STEM model. Lastly, I examined the thesis written by *Katharine M. Keough* about the history of the *Black Mountain College* experimental art school, as it provides an insightful rundown of the positive and negative aspects of trying to create an educational system with a progressive and artistic mindset. The work conducted by John Andrew Rice as an

academic innovator is also explored, mostly in relation to the founding of the Black Mountain College (Hom, 2014), (Jolly, 2014), (Yakman, 2008), (View Sonic, 2021) (Rice, 1942).

- At the same time, this overview of contemporary progressive educational model postulates is done alongside an analysis conducted on the topic of the early and mid-20th century North Carolina Black Mountain College.

- In regards to the study of the expected evolution of eastern education and academia, I focused my attention on the already mentioned *El gran sueño de China. Tecno-Socialismo y capitalismo de estado,* a book that, among many other things, provides a first-hand overview of how contemporary Chinese education works, and how it is expected to evolve, from the point of view of *Claudio F. González* (González, 2021).

- *In addition, a* series of articles written by third-party researchers provide an encompassing supplement to the research on this topic.

Relevant papers and works

- The report published by the *Organisation for Economic Co-operation and Development*, in regards to the future of education, titled *The future of education and skills, Education 2030* (OECD, 2020).

- The article published in *Live Science* by *Elaine J. Hom* about the topic of STEM education, titled *What is STEM Education?* (Hom, 2014).

- The original study published by *Georgette Yakman* in regards to the concept of ST∑@M Education:an overview

of creating a model of integrative education
(Yakman, 2008).

- The second study published by *Georgette Yakman* in
  regards to the concept of STEAM education, titled
  *STEAM Education Professional Development Practicum &
  Research* (Yakman, 2017).

- The article published by *View Sonic* about the topic
  of STEAM education, titled *STEAM Education: Preparing
  All Students for the Future* (Hom, 2014).

- The article published in *Education week* by *Anne
  Jolly* in regards to the nature of STEM and STEAM
  education, titled *STEM vs. STEAM: Do the Arts
  Belong?* (Jolly, 2014).

- The book published by *Claudio F. González* in regards
  to the nature of contemporary Chinese culture and
  economics, titled *El gran sueño de China. Tecno-
  Socialismo y capitalismo de estado* (González, 2021).

- The book published by *Bertram Russel* in regards to
  education, titled *On Education, especially in early
  childhood* (Russell, 1926).

5.6.1.3 An artistic mindset for education

Researchers

- To explore this topic, I focused my attention on the
  most successful and influential educational
  institutions that managed to integrate the artistic
  mindset into the academic process: the German Bauhaus
  and the North American Black Mountain College. To
  this end, I examined the essay written by Alexandra
  Griffith Winton on the topic of the Bauhaus, and the

thesis written by *Katharine M. Keough* about the history of the *Black Mountain College* experimental art school. The work conducted by John Andrew Rice as an academic innovator is also explored, mostly in relation to the founding of the Black Mountain College (Winton, 2016), (Keough, 2013), (Rice, 1942).

Relevant papers and works

- The essay written by *Alexandra Griffith Winton* about the history of the Bauhaus, titled *The Bauhaus, 1919—1933* (Winton, 2016).

- The article published by *Invaluable* about the achievements of the Bauhaus, titled *How Bauhaus Art Radically Changed the Modern Landscape* (Invaluable, 2019).

- The thesis written by *Katharine M. Keough* about the history of the Black Mountain College, titled *Black Mountain College 1933–1956: In Awe of the Absolute Form* (Keough, 2013).

- The autobiography written by *John Andrew Rice*, titled *I Came Out of the Eighteenth Century* (Rice, 1942).

- The manifesto for the *Free International University for Creativity and Interdisciplinary Research,* written by *Joseph Beuys and Heinrich Böll,* and the bibliographic analysis that follows it, written by one of *Beuys's* biographers (Beuys and Böll, 1973).

- The study conducted by Terry Flew in regards to the concept of creative humanism, titled *Creativity, the 'new humanism' and cultural studies* (CSU, 1980).

5.6.2 Which ones are the key theories and hypotheses?

5.6.2.1 Contemporary education and academia

Research and hypothesis

- Both predominant contemporary educational and academic models are based on some of antiquity's most significant philosophical theories. Western education is based on Socratic, Platonic, and Aristotelian philosophy. Eastern education is based on Confucian and Buddhist philosophy (Fuller, 1969), (Li, 2021).

- Traditionally, in western cultures, the main focus of education has been the cultivation of the intellect for the betterment of the individual, with debate and oratory being core aspects of the process. In contrast, in eastern cultures, education has served a harmonizing purpose, a way for people to learn to be better individuals for the benefit of society. As a consequence, debate plays a much smaller role in eastern education than it does in the west, which increases social harmony at the cost of curtaining innovation (Fuller, 1969), (Li, 2021).

- While theoretically, eastern education has always been less discriminatory towards who can access education, in practice, both culture groups have utilized their educational and academic systems to organize society hierarchically. Buckminster exemplifies this really well in his book, explaining step by step how the rise of the original international commerce groups in antiquity lead to the conception of hierarchal education as a way for influential individuals to maintain control over multiple nations and cultures (Fuller, 1969), (Li, 2021).

- While power structures have changed significantly since antiquity, the educational systems that are utilized in the present day are direct descendants of the original ones, with all the benefits and problems that that entails. Barring the most innately cultural differences, both eastern and western education and academia serve as a way to organize society hierarchically, each individual learning only what they need to fulfill their role in society, and they both do so through the teaching of canned information and the constant evaluation of the individual in comparison to a set standard. While this system is relatively efficient in regards to the formation of professionally prepared individuals that are useful to society, its major weakness resides in the way it curtains social adaptability, innovation, diversity, and critical thought (Fuller, 1969), (Li, 2021).

- It is also significant to mention that modern educational systems tend to mentally exhaust their students, in many cases leading to severe depression or even suicide in the face of academic failure, something that can be considered an extremely amoral injustice if we take into consideration the biased nature of contemporary examination methods. This is, however, more predominant in eastern nations than in western ones, as the life quality one can expect to enjoy in their adulthood is way more linked to academic success in the east than in the west (Fuller, 1969), (Li, 2021).

- These problems are exacerbated by the fact that, because of the severe economic and social inequalities currently present between developed and developing countries, only those who live in developed ones have access to quality education.

Solving those disparities will be essential for the future of our species (UNESCO, 2021).

- Even then, it is not unusual even among those living in developed countries to have to deal with severe complications in accessing higher levels of education, especially in those nations where education is primarily the domain of the private sector. In that regard, the most evident example is that of the USA, where the cost of college tuition fees ranges from a minimum of 27.000$ in public colleges to more than 100.000$ in private ones. These costs heavily limit the access to higher education for everyone but those who come from economically accommodated families. All in all, it has become evident that the influence that the private sector has on education should be curtained worldwide, as its prevalence is highly detrimental to the formation of the newer generations (UNESCO, 2021), (Bridgestock, 2021).

- In developed countries, educational inequality is primarily caused by the influence of the private sector. In contrast, in developing ones, it is caused by the scarcity of academic resources and by ideological factors. As the education of a populace is usually the sole responsibility of the nation they live in, the chances of an individual being able to access even basic education become a luck-based game, their birthplace, gender, and family status being the main factors determining their academic future (UNESCO, 2021).

5.6.2.2 New educational and academic models

Research and hypothesis

- It appears that most academic institutions in western and eastern nations are betting on the STEM formula in the face of the challenges posed by the future. In essence, this means prioritizing the teaching of Science, Technology, Engineering, and Mathematics over other subjects, and doing so in a mostly interdisciplinary way that extends from primary school to high-level education (Hom, 2014).

- It is important to mention that the concept of STEM education is not only to prioritize the teaching of those four disciplines but to do so in a way that creates synergic relations between them (Hom, 2014).

- The focus put on these subjects is caused by the perception that the proliferation of the new emerging technologies, especially those related to artificial intelligence, will render most professions unrelated to STEM subjects largely obsolete. What is more, most of the analysts that are evaluating the readiness of contemporary nations in the face of emerging technologies like automation reiterate the importance of this type of education (Hom, 2014), (The Economist Intelligence Unit 2018).

- However, the most significant pitfall of STEM-based educational systems resides in how they tend to sideline the Arts and Humanities, as this can significantly compromise the emotional, empathic, and creative development of the newer generations. This is why some western educational innovators are attempting to integrate the Arts into the STEM model,

turning it into the STEAM model (Yakman, 2008),
(Jolly, 2014), (Yakman, 2017), (View Sonic, 2021).

- In essence, STEAM education defends that integrating
  parts of the artistic mindset into the STEM formula
  would enhance the capabilities of all students, as it
  would stimulate their creativity, critical thought,
  and passion. However, STEAM education models have had
  a way more timid reception than their STEM
  counterparts, primarily because of the structural
  difficulties that arise from trying to integrate the
  Arts and Humanities with the rest of the STEM
  subjects, as practically all of the educators that
  are currently teaching STEM subjects have little to
  no experience with the artistic and humanistic
  disciplines (Yakman, 2008), (Jolly, 2014), (Yakman,
  2017), (View Sonic, 2021).

- The most significant challenge that STEAM education
  faces is that the artistic mindset is largely
  incompatible with the structure and workings of
  conventional education systems. As these systems
  prioritize over-specialization through the
  transmission of pre-selected information and the
  strict evaluation of the student, there is simply no
  practical way to integrate an artistic mindset into
  them unless their entire structure is rewritten
  (Yakman, 2008), (Jolly, 2014), (Yakman, 2017), (View
  Sonic, 2021).

- It is expected that eastern nations will focus on the
  STEM model as much as the western ones. However, as
  eastern education has always tended to prioritize the
  acceptance of well-established traditions over
  critical thought and innovation, eastern education is
  encountering severe difficulties when it comes to

reconciling the harmonizing nature of their system
with the need for technological and cultural
innovation (González, 2021), (Li, 2021).

5.6.2.3 An artistic mindset for education

Research and hypothesis

- Since the Bauhaus and the Black Mountain College, no
  academic institution has been able to integrate the
  artistic mindset into the educational process. In
  grand part, this can be attributed to the same actors
  that caused the decay and eventual closure of those
  two institutions: the lack of political support, the
  wear and tear of their faculty, and their progressive
  assimilation by more traditional educational
  institutions (Keough, 2013), (Winton, 2016), (Rice,
  1942).

- It is significant to mention that the state in which
  the art world was in the west in the early 20th
  century has many similarities with how it is now:
  while the advent of photography in the mid-19th
  century liberated artists from their role as encoders
  of reality and managed to democratize art as a
  process, forcing and allowing artists to delve into
  more experimental art forms, it also raised many
  concerns in regards to the potential fall into
  irrelevance of the arts as a consequence of
  technological innovation. This fear is one of the
  main reasons why Walter Gropius conceptualized the
  Bauhaus experimental art school. Gropius, who was
  deeply disenchanted by the traditionalist mindset of
  the artistic academia of the time, wanted to create
  an environment in which creators could search for a

way to reconcile artistic innovation and technological progress in a practical way that would benefit both fields (Winton, 2016), (Invaluable, 2019).

- The Bauhaus managed to revolutionize the concept of artistic creation by codifying the idea of functional art. On the one hand, the school embraced the teaching of architecture, interior design, cabinet design, and metalworking instead of focusing exclusively on painting and sculpting. On the other hand, the school developed and followed a series of creative tenets that managed to encode a form of art that was equally functional as it was beautiful. Those tenets included the prioritization of function over form, the importance of minimalism, the relevance of architectural and spatial design, and the integration of technological innovations into the artistic process. By following them, not only did the Bauhaus attract students from many non inherently artistic disciplines, but the aspiring artists that formed themselves in the Bauhaus learned to create works of art that were useful, beautiful, and easy to produce on a mass scale (Winton, 2016), (Invaluable, 2019).

- This had the double effect of democratizing the learning of the arts among a traditionally pragmatic people and helping the forming artists to develop their works in an environment that facilitated its eventual marketability, a factor that proved to be vital to financing the school (Winton, 2016), (Invaluable, 2019).

- In that regard, we can say that the Bauhaus was a success, as it did manage to give shape to an

economically self-sustained environment in which artists managed to merge artistic and technological innovation in a synergic and practical manner for the benefit of all society. However, the rise of National Socialism in Germany threatened the school's existence, ultimately leading to its closure in 1933. The most significant figures of the Bauhaus migrated to the USA, where they used their expertise to help create other educational institutions (Winton, 2016).

- It was also in 1933, soon after the closure of the Bauhaus, that the Black Mountain College was founded in North Carolina by John Andrew Rice, Theodore Dreier, Frederick Georgia, and Ralph Lounsbury, a group of academics that had been expelled from the Rollins College for voicing their opinions against traditional education, their main goal being that of creating an academic institution that would not only train individuals in practical matters, but that would also form them as persons. It is significant to mention that it was only thanks to a generous donation of 10.000$ made by Mac Forbes, who had been a college of the group at Rollins, that the project managed to gather enough money to become a reality (Keough, 2013), (Rice, 1942).

- Most of the artists and academics that had been part of the Bauhaus found their new home in the Black Mountain College, and their accumulated experience proved critical in designing and running the institution. Among these individuals is important to mention the contributions made by Josef and Ani Albers. Josef eventually became the faculty's director and helped incorporate many of the postulates of the Bauhaus into it (Keough, 2013).

- In any case, it is essential to mention that the BMC did not aspire to become an experimental art school, but an interdisciplinary universal school defined by an artistic mindset (Keough, 2013).

- It was in the first years of the institution that its fundamental tenets were established, many of which were directly inspired by the academic postulates made by Andrew Rice himself, summed to the experience given by those who came from the Bauhaus (Keough, 2013), (Rice, 1942).

- What those who designed the BMC criticized about traditional education at the time: that education should not be a way to regurgitate a standard stack of ideas, that education should not reduce the intellectual value of a person to a minimum common denominator, that education should no overvalue tradition over critical thought and innovation, that education should not be a closed system with a defined endpoint, that education should not be focused only on nurturing the intellect over emotional development, that education should not over-prioritize the individual over the community, that education should not disregard the uniqueness of each individual and that education should not position teachers and students in different levels (Keough, 2013), (Rice, 1942).

- The core goals of the school were as follows: to nurture the intellect and the emotions in equal amounts, to teach things as a process/method more than as a collection of content, as the content is a reflection of a time period, to teach the importance of critical thought, to teach through experience, to teach the value of the individual and that of the

process of learning as a way to discover and define oneself, and to find a balance between the individual and the collective, something that was achieved mainly by structuring the whole institution in a non-hierarchical way, and by making professors and students alike take part on the definition of the school through the democratic process (Keough, 2013).

- In essence, those who created the BMC applied the artistic mindset to the workings of an academic institution with the goal of drawing bridges between the rational and emotional sides of the mind. In this regard, Josef Albers constantly defended the idea that art was the only force capable of combining intellect and emotions in a synergic way (Keough, 2013).

- In general terms, the BMC attempted to dissolve the following dualisms: the distinctions between women and men, school and society, thought and life, intellect, and character, fine and useful arts, pass and failing academically, underclass and graduate, work and play, riches and poverty, knowledge and inspiration, professional and amateur. The only harmful dualism the School did not tackle directly until its latter years was racial segregation, because many In the faculty feared that embracing desegregation would make them enemies of the local community, compromising their existence (Keough, 2013).

- To achieve their educational goals, the school structured itself openly and democratically: while pedagogy planning, external relations, and administrative activities were the responsibility of the faculty alone, everything else, from the running and maintaining of the facilities to the designing of the general academic plans was shared equally between

the professors and the students. The democratic
process permeated every inch of the school. However,
Rice recognized that ideological subgroups and
leaders like individuals did emerge among the
students, giving shape to a sort of natural
aristocracy that was small in scale (Keough, 2013).

- That last realization, summed with the economic
limitations it faced, is what made the faculty decide
to keep the BMC small. In turn, this behavior caused
many to criticize the BMC for its apparent elitism,
for the institution could only accept a select number
of new students each year. The faculty defended
themselves by saying that they were doing their
utmost to take their educational model to as many
persons as their resources and structures allowed,
and they encouraged other academics to create similar
colleges. Ultimately, if the BMC can be considered an
elitist institution or not is up to personal
interpretation (Keough, 2013).

- In theory, this open approach to community and
education was to give shape to an open and democratic
community that encourages individuals to show their
true selves to others. With both their virtues and
weaknesses made open to the group, it was the group
that, in goodwill, would encourage the individual to
better themselves for their own benefit and that of
society in equal measure. In practice, this theory
proved to be accurate. However, a non-insignificant
number of students found that the constant scrutiny
they were submitted to, even if it was in goodwill, put
a heavy strain on their psyche, something that was more
prevalent among introverted students (Keough, 2013).

- On a personal level, and apart from having to attend a series of mandatory classes in the first years, every student had the choice to study what they wanted, as they wanted, with professors fulfilling more of a guiding role in their education than that of a traditional teacher. Students, however, were encouraged to focus on more generic subjects in their first years, and only to specialize in their latter years. Traditional examinations were not a part of the BMC, with the exception of an open examination period realized at the conclusion of the junior years, in which the students were submitted to the scrutiny of the whole school. As learning from experience was a key aspect of the school, it was usual for new students to repeat the same mistakes that previous promotions had made. The faculty reiterated the value that this experience had in the development of their students. However, by many accounts, this behavior put a heavy strain on the professors, which wore down their resolve as the years passed, and ultimately caused many of them to leave (Keough, 2013).

- Because of how education worked at the time, those who graduated from BMC had to submit themselves to a more traditional evaluation of their skills in another faculty of their choice if they wanted to obtain official academic recognition. In most cases, the students received excellent marks in these examinations (Keough, 2013).

- Ultimately, however, the experimental approach that the BMC adopted proved successful: their students not only became extremely well versed in their subjects of choice, but they also learned to be better persons that were true to their nature and responsible for

their community. The BMC became the crucible for many
of the most revolutionary and progressive ideologies
and postulates that emerged in the mid-century USA.
However, the American government silenced many of
those initiatives, leaving only the less evident ones
standing (Keough, 2013).

- That same disdain shown towards the college by
  conventional academics, mass media, and the US
  government eventually caused the college's closure.
  Simply put, there was no place in the increasingly
  paranoid and nationalistic culture of the mid-century
  USA for a progressive institution such as the BMC.
  Public opinion drained the college of its students and
  funds, forcing it to close in 1957 (Keough, 2013).

- Many of those who worked in the BMC as professors at
  the time went to work at other academic institutions,
  but they never managed to have an impact as
  significant as the college did (Keough, 2013).

- There is, however, another academic institution of
  significance that should be mentioned on the same
  page as the Bauhaus and the Black Mountain College,
  that one being the German *Free International
  University for Creativity and Interdisciplinary
  Research,* founded in 1973 by Joseph Beuys in
  collaboration with Klaus Staeck, Georg Meistermann
  and Willi Bongard (Beuys and Böll, 1973).

- In many ways, the FIU became a spiritual successor to
  the BMC, as it attempted to create an open,
  interdisciplinary environment for learning, teaching,
  and cultural exchange that was defined by an artistic
  mindset and had no ties with traditional academia.
  While the BMC focused on developing a singular physical
  institution, the FIU was conceived as a more abstract

international initiative designed to work in parallel to traditional academia (Beuys and Böll, 1973).

- The main goal of the FIU was to create an interdisciplinary and cooperative international environment that would help all individuals, not only artists, in developing their personality and creative skills for their betterment and that of society. This concept was named democratic creativity and was significantly linked to the idea of direct democracy (Beuys and Böll, 1973).

- Through democratic creativity, the FIU attempted to counter the most evident problems present in the western societies of the late cold war era world: the decay of the democratic process, the increasing power of the technocrats and oligarchs, the decay of the natural environment caused by human activity, the possibility of misused technological progress displacing individuals, and the dilution of culture and art into a globalized form of culture defined by consumerism and cultural assimilation. In this context, and much like the BMC, the FIU treated and utilized the concept of art more as a mindset and a process than as a strictly defined discipline, a clear indication of the influence that the FLUXUS movement had in its foundation (Beuys and Böll, 1973).

- It is also important to mention that throughout its existence, the FIU attempted to gain legal recognition as an academic institution, but its exceedingly experimental nature dissuaded the legal authorities from granting the school a legal status (Beuys and Böll, 1973).

- Unfortunately, the exceedingly experimental nature of the FIU summed to the inability of its founders to find a reliable source of income to finance it, heavily limited its impact beyond the art world. Its influence in regards to the development of the concept of direct democracy was also significant, and it played a vital role in the founding of the German Green Party (Beuys and Böll, 1973).

- Ultimately, the increasing prevalence of globalized culture in 1980, summed to the death of Joseph Beuys in 1986, caused the original FIU to dilute and practically disappear by the end of that decade. Many other European academic organizations have attempted to follow the FIU's footsteps since, most notably the *Demarco Foundation,* the *Summerhal* of Edinburgh*, and* the *Troubled Image Group, and Art & Research Exchange* of Belfast*.* However, traditional academia has largely assimilated or isolated these initiatives (Beuys and Böll, 1973).

- More recently, the study conducted by *Terry Flew* remarked on the relevance of the creative mindset, as understood from a humanist perspective, as a defining characteristic of the human being and an essential aspect of innovation, remarking on its relevance for the educational and academic process (Flew, 2010).

5.6.3 Which ones are the gaps my research is trying to fill?

5.6.3.1 Education and Academia

Gaps

- It is highly troubling that, for the most part, both western and eastern contemporary nations, no matter their level of development, have ended up treating education and academia more as a means to an end than an end in itself. Practically all contemporary educational institutions are focused on the professional and cultural training of their students as a means to turn them into productive and complacent members of society, which makes them largely neglect, or even suppress, the development of their emotional skills, their empathy, their personality, their creativity, and their critical thought.

- Apart from the work of some genuinely good-willed academics, no significant initiatives are currently trying to change this perception, which ultimately causes the devaluation of education and academia. This situation largely stems from the influence that traditional education still holds, which is true for eastern and western nations alike.

- Fearing that the new emerging technologies might render contemporary education obsolete, most developed nations are attempting to focus their educational systems on teaching STEM subjects at the expense of cultural, emotional, and artistic education. This focus further contributes to the devaluation of education because a less emotionally, culturally, and artistically developed society will more than likely prove to be way less capable of adapting to the sudden radical challenges that the

emerging challenges of our time will bring forth than a society more versed in those fields.

- It is true that, at least in western nations, an attempt is being made by a non-insignificant amount of academics to integrate the artistic mindset into the STEM model. Unfortunately, if we compare these attempts with what the Black Mountain College achieved almost a century ago, it is easy to see that the STEAM model will not be as impactful, mainly because even if it does manage to integrate the arts and the humanities as subjects into the STEM model, it won't be able to truly incorporate the artistic mindset into STEM as long as this model is imparted from a traditionalist academic mindset.

- It is also important to point out that, apart from the work done by some good-willed but small scaled initiatives, no significant coordinated attempts are being made by the international community to solve educational inequality.

- Since the start of the 21st century, there have been no direct attempts to create an academic institution successor to the spirit of the *Bauhaus*, the *Black Mountain College,* or the *Free International University,* with the closest proposal being that of the more streamlined and traditionalist STEAM education. With the challenges posed by the new emerging technologies and events endangering the future of our species, and with traditional academia focused on promoting an increasingly technocratic educational model, it is becoming increasingly evident that the creation of a modern and functional version of what these institutions posed would go a long way in guaranteeing the future of our species.

237

- Through this dissertation, I aim to tackle these problems by designing a hypothetical decentralized academic, cultural and artistic system inspired by the work conducted by the Bauhaus, the Black Mountain College, and the Free International University. To design said system, I aim to incorporate many of the technological innovations made possible by the new emerging technologies, such as Artificial Intelligence and Automation, to ensure its ease of access and use by everyone, no matter their birthplace or economic situation.

- Much like those institutions posed, I aim to conceptualize a set of tools and emergent environments that could help individuals develop their true personalities and skills in a way that is alighted with the artistic mindset and the democratic process. I argue that such an environment would have to foster critical thought, creativity, curiosity, passion, individuality, cultural diversity, cooperation, genuine equality, technological insight, and socio-environmental responsibility.

5.7 Literature Review, Conclusions

⬤———⬤———⬤———⬤———⬤———⬤|

    This last section of the literature review offers a conclusive analysis of the collected research data.

5.7.1 Contextual underlying questions, emerging technologies:

1. Which emerging technologies are most likely to have a radical impact on human civilization?

- The most significant emerging technologies that will define the next 100 years are those related to Artificial Intelligence, Automation, Wireless Communication, Augmented Reality, Virtual reality Genetic Engineering, Cybernetics, Nano-Engineering, and Geo-Engineering.

2. When will the development of these technologies conclude? When will their use be generalized?

- These technologies will progressively enter general use through the next 100 years, with their simpler forms being released first and the most advanced ones being released In the second half of the 21st century.

3. In which ways could those technologies affect human society in positive ways? And in negative ways?

- How each of these technologies could affect our species is studied on each of their respective topics within the literature review. In broad terms, each of the upcoming emerging technologies has the potential to revolutionize the fields they are related to and cause a revolution comparable to the previous industrial, medical, and cultural revolutions.

- Similarly, each of the upcoming emerging technologies can potentially turn the contemporary practices associated with their respective fields obsolete. In conjunction, the upcoming emerging technologies have the potential to redefine what humanity is, with the associated risk of making the human being obsolete in the process if we don't manage to adapt to the changes and challenges they will bring forth. What is clear is that these technologies will ultimately redefine our nature, for better or worse.

4. *Is human society ready to utilize these emerging technologies in a generally positive, equitable, and responsible way?*

- Our species is culturally and politically unprepared to utilize these technologies responsibly for various reasons, chief among them being the non-accountable nature of contemporary politics, the self-destructive nature of modern economics, the close-minded nature of traditional education, and the self-indulgent nature of globalized culture.

5. *How can we better prepare ourselves for their arrival?*

- Much can be done to better prepare ourselves for the arrival of these technologies: from enacting preemptive political reforms that would soften their introduction, to conducting extensive educational and

cultural reforms that would help the general
population adapt to them. However, given the world's
current socioeconomic and political state, we can not
expect that contemporary governments will be able to
conduct these reforms in a significant and positive
way.

6. ***How could these new technologies interact with the
cultural, educational, and artistic disciplines?***

- Culture, education, and art will not only be
redefined by these technologies but will also play a
key role in determining if we succeed in making
sensible use of them. This is one of the central
topics of my research and thus will be developed in
great detail in the main part of the thesis.

5.7.2 Contextual underlying questions, emerging challenges:

1. ***Which are the most relevant, civilization-threatening
emerging natural challenges of our time?***

- The most significant emerging natural challenges we
will face are those related to the appearance of
highly harmful new diseases, those related to space-
based hazards, and those related to the potential
eruption of super-volcanoes.

2. ***Which are the most relevant, civilization-threatening
human-caused emerging challenges of our time?***

- The most significant emerging human-caused challenges
we are going to face in the upcoming decades are
those related to environmental and climate
degradation and destabilization, those related to the
development and use of the new emerging technologies,
and those associated with the extreme homogenization

and trivialization of culture caused by cultural
globalization, those related to the fragility and
potential collapse of the free market economic
system, those related to the extreme polarization,
centralization and trivialization of the political
system, and those related to the emergence of new
potential global security threats as a consequence of
the development and utilization of the new emerging
technologies.

3. **How can we better prepare ourselves to face those**
   challenges?

- This question is addressed in the chapters <u>dedicated</u>
  <u>to studying these challenges</u>[5.2.2.6].

4. **How could the cultural, academic, and artistic**
   disciplines help us overcome those challenges?

- Evidence suggests that a sensible form of culture and
  art could play a key role in helping us overcome
  these challenges. Similarly, evidence also indicates
  that a non-sensible form of culture and art could
  have the opposite effect.

5.7.3 Contextual underlying questions, emergence, and neural networks:

1. **Can life and intelligence be explained as weak**
   emergence? Which ones are the different scientific
   opinions in this regard? Can consciousness be
   explained as weak emergence? Which ones are the
   different scientific opinions in this regard?

- As consciousness is inherently subjective in nature,
  there is no possible way to explain it in a truly
  objective way with contemporary scientific

techniques. However, this doesn't preclude us from analyzing the evolutive process of life, intelligence, and consciousness understood from a framework aligned with the concept of emergence. As a consequence, the scientific community is divided between those who believe that we will never be able to explain the emergence of consciousness in a truly scientific way and thus catalog it as a strong emergent, and those who believe that we will eventually be able to explain it in its totality as a weak emergent.

2. ***What are the factors that trigger evolutive emergent behaviors from the interactivity of simpler systems?***

- The emergence of a novel behavior occurs when a system's constituents and its interactions achieve a critical organizational complexity mass that manages to stay stable long enough for the emergent to occur, thus triggering the feedback loop that stabilizes the system long term by constraining self-destructive patterns, and allows the emergent to persist. Environmental adaptation, especially adaptation against sudden environmental changes, also plays a crucial role in defining the characteristics of a novel emergent feature.

3. ***Can human social structures be understood as emergent behaviors?***

- Human social structures can be easily understood as emergent behaviors. There are many parallels between the organizational structures that define human societies and those that compose natural emergent systems.

4. Could human interaction trigger an evolutive emergent behavior? Could such an emergence be positive or negative?

- It is simply not possible to know if human interaction could trigger the emergence of a more complex evolutive state, but by comparing human organizational and information structures to those that have given shape to other evolutive emergents, we can see clear parallels between each other: If human interactivity manages to achieve a critical complexity mass that remains stable for a prolonged amount of time, and an environmental challenge significant enough emerges at that point forcing humanity to adapt, an evolutive emergent behavior could, perhaps, trigger.

- We can only theorize about what behavior such an emergent could have, or whether it would be positive or negative to us. As emergent behaviors are the synergic result of the interactions of their constituents, we can assume that this emergent mind would inherit the general behavior displayed by our civilization, for better or worse.

5. Would it be possible to create cultural, artistic, academic, and scientific interdisciplinary networks that mimic the structures capable of generating positive emergent behaviors?

- Because human organizational structures can already be understood as emergent systems, it would be theoretically possible to optimize their capacity to generate positive emergent behaviors by redefining them in tune with the nature of naturally occurring emergent systems. This approach has many potential

positive applications for the educational, cultural, and artistic disciplines.

5.7.4 Contextual core questions:

1. How could cultural and artistic disciplines evolve for the next one hundred years if current socio-economic trends and technological innovations are maintained?

- Everything seems to point out that if current socioeconomic trends do not change, most forms of contemporary culture will be eventually assimilated and diluted into the mainstream globalized culture, a process that will be further accelerated by the adoption of the new emerging communication and information technologies by the mass media and social network platforms. However, it is very significant to mention that the increasing presence of Chinese cultural influence in the world will more than likely lead to the emergence of a second, Sino-centric, globalized culture that will exist in opposition to the current western globalized culture.

- The defining characteristics of these cultural movements are explored in their respective sections within this literature review. Similarly, it is also evident that if current artistic trends do not change, the increasing senseless pluralization, commodification, and acceleration of the art world will lead to its almost complete dilution into the globalized culture.

2. How could academic disciplines evolve for the next hundred years if current socio-economic trends and technological innovations are maintained?

245

- Current trends seem to point out that educational institutions worldwide will start to focus on the STEM educational model from now on, as many experts tend to agree that the subjects STEM focuses on (Sciences, Technology, Engineering, and Mathematics) are going to be the most relevant ones in regards to the construction of the future.

- The STEAM academic model, which attempts to integrate the Arts into the STEM model, presents itself as the other most relevant educational model of our time. However, the academic institutions that have attempted to enact this model have found serious hurdles in doing so, because most of their faculty lacks the art experience necessary to execute the model properly.

- It is expected that the new emerging technologies will speed up a significant part of the workings of the academic world, thus making it far more affordable for those with limited resources to pursue higher education.

3. ***How could human socio-economic structures evolve over the next one hundred years if current trends and technological innovations are maintained?***

- The future of socioeconomic and political structures will more than likely be linked to the emergence of new technologies and the evolution of the globalized culture. In general terms, it is expected that the current western dominated socioeconomic and political world will be fractured into two power blocks: a western one led by the USA and Europe, and a Sino-centric one led by china. In both cases, it is expected that the new emerging technologies, especially those related to Artificial Intelligence,

Information, communication automation, and surveillance, will play a critical role in determining tomorrow's political and socioeconomic structures.

5.7.5 Core research questions:

1. *In which ways could education and academia help us make more responsible and equitable use of the new emerging technologies? In which ways could education and academia help us face the challenges of the future? How could education and academia adapt to the world of tomorrow sensibly?*

- Education could play a critical role in determining if we can adapt successfully to the upcoming technological revolutions and challenges. However, for this impact to be positive, it will be essential for education as a discipline to undergo a significant redefinition worldwide. Most modern educational systems focus on the formation of individuals regarding the professional world, a focus that is too narrow and will more than likely become obsolete in the upcoming decades due to the emergence of Ai technologies.

- Developing a more sensible form of education focused more on helping individuals become the persons they want to be, instead of one that simply tries to turn them into functional pieces of a narrow social and professional system, will more than likely prove to be key in guaranteeing that we as a species can survive, adapt and thrive in the world of tomorrow. However, if we consider the reactive nature of contemporary democracies and the narrowly focused

mindset of contemporary authoritarian governments, we should not expect that such a reform will come in time, or at all, from their part. In consequence, it will be essential to design such an educational system differently.

2. *In which ways could culture help us make more responsible and equitable use of the new emerging technologies? In which ways could culture help us face the challenges of the future? How could culture adapt to the world of tomorrow sensibly?*

- Above everything else, culture is the direct and indirect result of everything we have been and currently are as a species, and thus can be understood as emergent behavior that emanates from human perception, reason, emotion, imagination, and interaction, one that, in return, permeates and helps us define all that we are, and all we could be.

- Culture is, by its very nature, diverse, scalar hierarchical, and ever-changing, which means that culture is sub-divided into an extensive set of sub-groups that are defined by the characteristics of the societies that define them, the feedback loop-based relationship they establish with them, and the influence they have in regards to culture as a whole, being as positive or negative as those societies would make them be in direct and indirect ways. This means that each specific culture can be as beneficial as it can be detrimental, depending on the nature of the communities that define them.

- After having concluded this literature review, I can say without a doubt that the current two dominant culture groups, the western globalized culture and the emerging Sino-centric globalized culture, are

more detrimental than they are beneficial, as they ultimately only contribute to the dilution of human diversity, emotion, empathy, creativity and criticality at the service of excessive commodification and ideological imposition. All seems to point out that these two cultural groups will severely compromise our capacity to recognize, adapt and overcome the challenges of the future.

- A sensible form of culture, one that emanates from each individual and manages to organize itself in a way that takes into consideration the nature of social emergent behaviors as a way to find a scalar balance between the uniqueness of each person and the collective interaction and cognition of humanity, could help our civilization obtain the level of diversity and organizational stability it needs to overcome the challenges posed by the future. Ultimately, this type of emergent culture would also help us find our place as a species in what concerns the future as a whole.

- If we also consider the implications of the evolutionary theory based on emergence, and we assume that an evolutive emergent could emerge from human interaction reaching a critical mass, developing this type of culture could prove to be vital in guaranteeing that such an emergent would be beneficial, instead of detrimental, to our species and itself.

- As a culture such as this would need to largely emerge from human interaction instead of being imposed, it would be up to a sensible form of education and communicational structural arrangement to help it come to be. As this task can not be

entrusted to contemporary democratic and
authoritarian regimes for obvious reasons, it will
need to be carried out in alternative ways.

3. *In which ways could art help us make more responsible
   and equitable use of the new emerging technologies?
   In which ways could art help us face the challenges
   of the future? How could the artistic disciplines
   adapt to the world of tomorrow sensibly?*

- Regarding how art could help us face the challenges
  posed by the future, it would be appropriate to talk
  about two distinct aspects of it: art as a discipline
  and art as a mindset.

- Both aspects share the same core quality that could
  make them invaluable in helping us overcome those
  challenges: they allow the individual to encode their
  perception of the world through a creative process
  that is fulfilling and innovative, and that manages
  to synergize reason and emotion.

- First, let's concentrate on analyzing the possible
  roles art as a discipline, materialized through the
  work of professional artists, creators, and cultural
  organizers, could fulfill to help us face the future.
  As I have already explored through this literature
  review, contemporary art is a diluted mess that lacks
  criticality and has largely become subservient to the
  postulates and trends set by the globalized culture
  and the will of high-level speculative investors.

- Some contemporary artists, academics, creators, and
  cultural organizers are still trying to think
  independently and make a difference. However, they
  will likely be unable to provoke a substantial
  positive social change with their work due to the

influence of globalized culture. Ultimately, it appears that art as a discipline is fading away with each passing day, as said globalized culture is diluting it.

- What can contemporary art do then to help us prepare for, face, and overcome the challenges the future will bring forth if it can not even save itself? For now, at least, there are two things that artists could do to tackle both problems simultaneously.

- On the one hand, those artists that dare to think for themselves should start to conduct their work in a way that is true to the nature and strengths of art. This would mean that, as explained by Hal Foster in *Bad New Days Art, Criticism, Emergency*, artists would have to elaborate and follow a strong and aesthetically well-defined personal artistic style that manages to mediate between reason and emotion while remaining critical to both the world and themselves.

- Apart from this defense of actuality, artists would also need to become technologically self-aware by studying and incorporating the currently most significant and emerging technologies into their practices. This would be key, as only by understanding and utilizing these technologies would artists be able to remain relevant in the face of technological revolution (Foster, 2015).

- By conducting their work this way, I argue that independent thinking artists would at least manage to remain true to themselves in a way that would preserve the essence of art. However, this would only be an act of survival, and would ultimately only pay off when the advent of the new emerging technologies

shakes the world enough to let independent thinking artists redefine the artistic disciplines into a more complete form that is attuned to the nature of the world of tomorrow.

- Their work regarding the preservation of actuality and the artistic mindset would also be key in that scenario, as it would help us elaborate systems capable of adapting to the challenges posed by the future by incorporating the artistic mindset into them (Foster, 2015).

- On the other hand, we have to consider the inherent capacity of artists to synergize reason and emotion through the artistic mindset. If we consider that the individuals that are developing the new emerging technologies do so mostly in isolation and with little consideration in regards to the unexpected effects those technologies could have, artists could be incorporated into those research groups as a way to balance and synergize their output, making those technologies more beneficial for the whole of humanity by providing an out-of-the-box critical perspective into their development.

- As explained in the articles published by Lufkin and Manning, this has already been proven to be an effective and more sensible way to conduct technological development. If it was to become a more common practice, it could preemptively solve many of the most harmful consequences the new emerging technologies could have, while also opening a new professional avenue for artists (Lufkin, 2017), (Manning, 2020).

- In regards to art as a mindset, it could also play a key role in helping us adapt to the challenges of the

252

future while helping us find a place and meaning in the world of tomorrow. The artistic mindset fosters individuality, creativity, and criticality while managing to synergize reason and emotion. If we consider that the new emerging technologies will radically alter society up to the point of making most of the current socioeconomic structures obsolete, the impartation of the artistic mindset to the general population, if done through a sensible educational system that encourages the balance between the individual and the group through democratic participation and criticality, would help each of us find our meaning and place in a world that will undoubtedly be too dissimilar to the one we are used to, by helping us to become more true to ourselves In a way that is passionate, rational, creative and respectful. This would lay the perfect foundation for creating a scalar form of culture that could give shape to a universal emergent culture (Foster, 2015).

4. ***How could we make the cultural, artistic, and academic disciplines and institutions more appealing and accessible to the general population?***

- The evidence seems to suggest that the creation of an interdisciplinary cultural, artistic, and academic emergent network capable of serving as an alternative to the traditional forms of those disciplines would go a long way in helping the general population interact and benefit from culture, art, and academia in a meaningful manner.

- In what concerns the artistic disciplines specifically, this analysis unveils that the incorporation of the artistic mindset into academia

would significantly increase the general population's interest in art, both directly and indirectly.

5. *Is it possible for a non-imposing universal human culture to exist? How could such a culture be created? Would such a culture be beneficial to human civilization?*

- After conducting this literature review, I now believe that it is possible for a non-imposing universal human culture to exist and that it would be extremely beneficial for our species. However, it would be more appropriate to call such a culture an emergent culture, as evidence points out that such a culture could only materialize through the creation of an emergent social network.

- If successfully created, an emergent form of culture would be extremely beneficial for the whole of our species, as it would help it synergize its diversity in a way that is beneficial for all, and will more than likely help us anticipate, adapt to and overcome the challenges of the future sensibly.

- After having studied the nature of cultural emergent behaviors, I have concluded what organizational structures are more likely to help those positive emergent behaviors arise: a scalar social and cultural environment designed in parallel to the nature of the structures that help positive emergents appear in nature, as determined by the study conducted by Feinberg and Mallatt, and in social environments, as explained by the study conducted by Tokita and Tarnita (Feinberg and Mallatt, 2020), (Tokita and Tarnita, 2020).

6. ***How could we create a universally accessible digital environment capable of synergistically integrating the cultural, artistic, academic, and scientific disciplines? Would shaping such a network in the form of an emergent network benefit human civilization?***

- This question is very closely related to the previous one. My findings have revealed how such a system could be created, but they have also made evident that its designing and creation would be too complex for a single individual to conduct sensibly. In any case, such an endeavor would far exceed the focus set for this dissertation. Thus this topic will only be tackled conceptually, with the goal of laying the foundation from which further research into the field could be conducted.

-

6 Theoretical Framework

6.0 Introduction to Theoretical Framework

What can Art, Culture, and Academia do to help us face the challenges posed by the future? That was the main question that I set out to answer when I started working on this thesis, and after having conducted the Literature Review of the topics that could potentially help me answer it, I have managed to identify a series of theories that will help me do so in an interesting and interdisciplinary way.

6.1 Ontological Approach

Because of its nature, this research project adopts a dual ontological approach that ultimately falls more within interpretivism than objectivism.

Regarding the theories concerning Art, Culture, Academia, and Sociology, this research project adopts an interpretivist approach as a consequence of the inherently qualitative nature of these subjects. In regards to the theories that concern the research and potential use of the New Emerging Technologies and those theories that study the evolution of life, intelligence, and consciousness as emergent behaviors, this research adopts an Objectivist approach, a consequence of the empirical nature of those fields of study. However, while the analysis of those theories is conducted from an Objectivist point of view, their latter analysis and integration with the previously mentioned Artistic, Cultural, Academic, and Sociological theories are conducted from an Interpretivist one, as the main concern of this research lies within those fields of study.

6.2 The Secular Humanistic Theory

I Choose The Secular Humanistic Theories as the central framework on which to construct my dissertation, as they provide a neutral outlook on the history and current state of our species and civilization that is tuned to our nature, thus providing both a sensible perspective from which to analyze my subjects of study and from which to construct my postulates.

Main proponents

- Francesco Petrarca

- Leonardo da Vinci

- Bertrand Russell

- Albert Einstein

- Carl Sagan

- Buckminster Fuller

- Gloria Steinem

Main postulates

- Reality as we know it, and the different forms of life that inhabit it, are not the work of supernatural forces, but rather the consequences of natural laws and the evolutionary process(Pinn, 2019).

- Only the use of reason and the scientific method can provide a sensible understanding of the universe. The explanations these methods offer should be understood as processes of understanding, not as definitive answers, because studying reality is a constant process (Pinn, 2019).

- Humans are not inherently good or evil but are rather defined by their nature and the environment. Individuals can form their own ethics and morals (Pinn, 2019).

- It is up to each individual to find their meaning in life through their understanding and interactions with reality (Pinn, 2019).

- Each individual is unique, and all individuals should have the same rights and privileges independently of their origin (Pinn, 2019).

- Humanity is extremely diverse. Said diversity should be understood as one of our species' strengths (Pinn, 2019) (CSU, 1980).

- Critical thought, personal freedom, and free inquiry are essential for the formation and well-being of the individual and society. It is the right of every individual to pursue their well-being. Every individual must pursue those aspects with responsibility. Every individual must be accountable for their actions (Pinn, 2019), (CSU, 1980).

- Education is the foundation for both the formation of individuals and the construction of society. It is up to education to provide individuals with the environments and tools necessary to form themselves in a way that is tuned to their way of being. It is up to education to help individuals develop a sensible set of ethics and a sense of responsibility, not to impose a predefined set of ethics on them. There is no place in education for religious or doctrinal enforcement (Pinn, 2019), (CSU, 1980).

- All humans are inherently curious, creative, and innovative. By synergizing those natural aspects with

rationality and the sensible studying of reality, individuals can innovate and lead to social progress. Therefore, the artistic disciplines should exist in synergy, not in opposition, to the scientific disciplines. It is essential for education to integrate these aspects into it for it to be sensible (Pinn, 2019), (CSU, 1980), (Flew, 2010).

- Society is essential for the individual, and the individual is essential for society, as each one can help the other sensibly define itself, as long as they are also capable of defining themselves in isolation if needed (Pinn, 2019), (CSU, 1980).

- The democratic process and the definition of a set of ethics based on rational thought and personal responsibility are essential for a society to be sensible and in tune with the nature of the human being. There is no place in a sensible society for state-sponsored religion (Pinn, 2019), (CSU, 1980).

- It is the responsibility of the state to sensibly provide all individuals with the necessary environments, resources, and tools necessary to help them become complete, responsible, and unique individuals and to guarantee their general well-being and safety. It is up to the individual to contribute to the general well-being and progress of the state sensibly in return (Pinn, 2019), (CSU, 1980).

What explanatory gap does this theory address?

- The difficulty of creating an interdisciplinary cultural study that considers the complex nature of culture.

What does this theory provide to my dissertation?

- A global framework on which to frame my dissertation.

- A foundation on which to construct my postulates.

I argue that the secular humanist theories offer a sensible and neutral outlook on the history and condition of the human being and civilization. This outlook perfectly aligns with my dissertation's objectives and my personal perspective on life. Most significantly, I argue that their definition of human nature, their remark on the importance of individuality, curiosity, and the artistic mindset in the innovative and ontological processes, their commentary on the relevance of rationality, the scientific process, and critical thought, and their outlining of sensible forms of academic and democratic organizational structures that are tuned to our nature provide an excellent foundation from which to conduct my research and construct my postulates.

I consider that Humanism, which was originally defined in early renaissance Italy by Francesco Petrarca, and its classical foundational counterparts, mainly the classical greek and Confucian philosophies, have played a fundamental role in fostering the advancement of civilization and the progressive betterment of the human condition through our entire history (Pinn, 2019). While it is true that the original conception of humanism was western-centric and did not account for many of the fundamental ethical and cultural values that we uphold in the present day, such as gender equality and cultural diversity, which prevented it from truly forming a universally humanist perspective, its progressive development in the last five centuries has seen it evolve into a philosophy that accounts for those aspects, giving shape to the contemporary Secular Humanist philosophy (CSU, 1980).

Most significantly, I consider that the Humanistic take on education, academia, innovation, and art which bridges rationality and the scientific process with the artistic mindset and the creative process into a single synergic discipline, has played a key role in fostering innovation and progress through our entire history, especially regarding shaping the cultural and technological changes that brought forth the classical, renaissance, enlightened and modern eras (Pinn, 2019), (AIC, 2022). This outtake, alongside the general perspective offered by the Humanist Theory, and especially the more recent Secular Humanist Theory, provide the main theoretical framework on which my dissertation is to be constructed. In this regard, all the other frameworks that are to define my research, which are way more specific in nature, stem from the Secular Humanist theory.

Ultimately, through this research, I aspire to contribute to the Secular Humanist theory, even if indirectly, by exploring how the artistic, cultural, and academic disciplines could evolve in tune with the secular humanistic postulates to help us overcome the challenges the future will bring forth.

6.3 Ramon Zallo's theory on Contemporary Culture

I Choose *Ramón Zallo's* theories on Culture and Cultural studies as the framework to conduct my analysis of contemporary culture and to lay down the foundation of the cultural postulates that are part of my dissertation. I consider that Zallo's theories, as they are presented in his last two published books, those two being *Estructuras de la comunicación y la cultura: Políticas para la era digital* (Zallo, 2011), and *Tendencias en comunicación: Cultura digital y poder* (Zallo, 2016), provide both an extensive analysis on the nature and economics of the culture of the information age and a critical overview of the cultural studies, mass communication systems, and cultural initiatives of our time.

Main proponents

• Ramon Zallo

Main postulates

• Culture encompasses practically all human disciplines, and thus can be defined as an extremely multi-faceted and complex discipline (Zallo, 2011 p. 23).

• In regard to our time, the most relevant disciplines that are related to culture are communication, art, history, philosophy, psychology, sociology, economy, and politics (Zallo, 2011 p. 23).

• The dominant cultural form of our time is globalized culture. This model prioritizes cultural homogenization and ideological polarization in the

service of the commodification of culture and
personal identity (Zallo, 2011 p. 27).

- Because of its nature, one has to account for all the
  disciplines that culture is related to in order to
  conduct proper studies on culture (Zallo, 2011 p.
  221-232).

What explanatory gap does this theory address?

- The difficulty of creating an interdisciplinary
  cultural study that considers the complex nature of
  culture.

What does this theory provide to my dissertation?

- A clear definition of contemporary culture.

- A framework from which to conduct my analysis on
  matters related to culture.

- A framework from which to construct my cultural
  postulates.

These theories provide the framework and focus from which I
can construct my cultural postulates. First, they identify and
define the multifaceted and interdisciplinary nature of Culture
(Zallo, 2011 p. 23). Then, they define and analyze the nature of
contemporary culture and its relation to the communication and
economic systems of the information age, emphasizing the
homogenizing (in regards to cultural diversity) and polarizing
(in regards to ideology and identity) nature of the mass media
and social network defined western globalized culture (Zallo,
2011 p. 27). Lastly, they provide a critical analysis of
contemporary cultural studies, exposing their narrowly focused
mindset, and pose a more sensible approach to studying

contemporary culture, an approach that considers its multifaceted nature (Zallo, 2011 p. 221-232).

In consequence, taking these theories as a framework, I can conduct my study of culture in a deeply interdisciplinary manner that accounts for its multifaceted nature. However, it is also important to mention that, because *Zallo's* work is primarily focused on studying contemporary western culture, I have decided to complement his theories with those posed by *Claudio F. González about the nature of modern Chinese culture*. These theories are exposed in the book titled *El gran sueño de China. Tecno-Socialismo y capitalismo de estado* (González, 2021).

6.4 Buckminster Fuller's theory on the History and of Education and Academia

I Choose *Buckminster Fuller's* theories on the History of Education and Academia because they conduct a deep analysis of the evolution of contemporary educational and academic structures from a critical and sensible point of view, providing the perfect framework from which to define the aspects of my dissertation that concern those fields.

Main proponents

- Buckminster Fuller

Main postulates

- Traditional educational systems are the direct descendants of the educational systems founded in antiquity to create proxy-based indirect governance systems.

- Because of their extreme focus on specialization, traditional educational systems are incapable of preparing individuals to face technological revolutions or highly impactful unexpected events.

- As a consequence of the social complexity increase caused by each technological revolution, traditional education has become even more specialization centric in order to maintain the proxy-based indirect governance system, thus making society more vulnerable to the disruptions caused by technological change with each passing century.

- Form Follows Function: artistic objects and environments can be beautiful and practical simultaneously.

- The long-term survival of our species will require the redefinition of our academic institutions into a more sensible form.

What explanatory gap does this theory address?

- The difficulty of conducting a thorough, critical, and sensible study on the history of education and its relation to technological evolution, power structures, and social organization.

- The difficulty of designing a sensible form of education.

What does this theory provide to my dissertation?

- A complex and sensible analysis of the history of education and its relation to technological evolution, power structures, and social organization.

- An evaluation of the dangers posed by extreme educational and social specialization in the face of technological evolution.

- A framework from which to design sensible educational models that are in tune with human nature.

The bulk of these theories are laid down in the book titled *Operating Manual for Spaceship Earth* (Fuller, 1969), and pose that contemporary educational models are the direct descendants of the educational models created by the most influential individuals of antiquity with the interest of creating a hierarchical specialization system that would let them govern the world indirectly through a system of proxies. Fuller remarks

on the significance these educational models had in permitting the evolution of modern civilizations and trade networks thanks to the system efficiency this model provided while chastising it for its tendency to undermine ideological diversity, scientific and cultural innovation, and critical thought (Fuller, 1969 p. 2-14).

Ultimately, *Fuller* remarks that this educational system is bound to be extremely detrimental to the survival of the human species in the long run, as its focus on the over-specialization of the individual in the service of a hierarchical power structure can only limit our species' capacity to innovate and adapt to unforeseen events (Fuller, 1969 p. 12). Fuller's analysis explores the evolution of traditional educational systems from antiquity to the midpoint of the 20th century, providing clear examples that support his theory. Every time that humanity has faced a significant natural, technological, and/or cultural challenge, the hierarchical and overspecialized social system created by the traditional educational models has been unable to adapt to those challenges in a seamless, peaceful, peaceful, and sensible way. *Fuller* points out that, generally speaking, those transitory periods have always been tumultuous, requiring an in-extremis restructuring of society that could have been avoided if a more sensible form of education and social structure had existed (Fuller, 1969 p. 2-14).

This theory also points out that in all the cases in which a crisis was fostered by the unexpected consequence of a technological revolution, the educational and social system has had to become even more specialized to maintain the hierarchy of power intact, thus making the system frailer with each technological breakthrough. Fuller explains that this tendency almost reached a critical point in the closing of the XIXth century, as the technological revolutions that defined that period did not manage to break the system but disrupted it

271

enough to cause the two consecutive World Wars (Fuller, 1969 p. 13). In the end, *Fuller's* theory sends a warning regarding the future of our species: the necessity to develop more sensible forms of education and governance that are not dependent on over-specialization, as the current systems might be unable to adapt to the next batch of significant challenges. Fuller would later become a professor at the Black Mountain College, helping define the experimental college.

Regarding my dissertation, *Fuller's* theory provides the perfect framework in which I can construct the foundation of my studies and postulates on the subjects of education and academia. While it is true that it has been half a century since this theory was first published, I think that it is still of great relevance if we consider the current state of the world and the technological, natural, and social challenges we could face in the coming decades. Nevertheless, I take this theory more as a starting point from which to construct my educational and academic studies and postulates than as a complete framework.

6.5 The Bauhaus theory of Art, Technology, and Education

I choose the *Bauhaus* theories about the artistic disciplines, the conduction of education from an artistic mindset, and the relationship between art and technology because I consider them extremely relevant to our time. *The Bauhaus* was founded in a time of technological revolution and social turmoil in which culture and art were commonly sidelined or ignored by most political and economic actors, a time not that different from our own, yet the experimental organization managed to prove that could not only art coexist with technological change, but that it was the only force capable of mediating between reason and emotion in a synergic way.

Main proponents

- Walter Gropius

- Josef Albers

- Anni Albers

Main postulates

- Art can remain relevant in the face of technological revolution. Art can be integrated with technology (Jiehong, 2021).

- Art can mediate between reason and emotion, creating synergies between them (Jiehong, 2021).

- Form Follows Function: artistic objects and environments can be beautiful and practical at the same time (Jiehong, 2021).

- The artistic mindset as a form of education (Jiehong, 2021).

- Art can be a successful yet sensible economical venture (Jiehong, 2021).

What explanatory gap does this theory address?

- The difficulty of proving the importance of bridging the artistic disciplines with the scientific and technological ones to society at large.

- The difficulty of creating practical synergies between art and technology.

What does this theory provide to my dissertation?

- A clear and proven definition of one of the core aspects of art: a force that bridges reason and emotion in a synergic way.

- A framework from which to construct effective postulates for the bridging of art science and technology.

- A framework from which to construct effective postulates for the creation of practical art forms.

The Bauhaus proved most of the theories it postulated, demonstrating that not only can art coexist with technological progress and revolution, but that it can develop a synergic relation with technology for the betterment of all of society. While the Bauhaus was ultimately put to an end by the emerging nazism, its postulates permeated many other organizations and educational postulates that managed to continue or even build on that legacy (Winton, 2016).

The theories posed by the *Bauhaus* offer the perfect framework from which I can build a very significant part of my artistic postulates, as the solutions they offer in regards to handling the complex relationship between art and technology are as relevant now as they were a century ago. Additionally, these same theories also provide a framework from which the artistic and academic disciplines can be combined into a system that accounts both for reason and emotion. However, this last point should be taken more as a point of origin than as a complete framework (Jiehong, 2021).

Ultimately, these theories are closely related to those postulated by *Buckminster Fuller*, *Andrew Rice,* and the *Black Mountain College* regarding education, serving as a way to synergize them with those theories more specific to the artistic disciplines.

6.6 The Black Mountain College's theory on Education and Academia

I choose the theories posed by the Black Mountain college because I consider that they provide the perfect parting point and framework from which a sensible form of education that can adequately respond to the emerging challenges of our time can be designed. The BMC was founded out of dissatisfaction with the traditional educational system and with the interest of creating an educational model that would help individuals form themselves both in intellectual and emotional matters throughout their entire life.

Main proponents

- Andrew Rice

- Buckmister Fuller

- Joseph Albers

Main postulates

- Traditional education is highly inefficient and wastes a very significant part of human potential.

- A more open, sensible, and democratic form of education build from an artistic mindset and based on learning through experience can provide the perfect environment to nurture creativity, criticality individuality, and passion in tune with responsibility and reason.

- Education and academia have to be open-ended prospects, not a closed system dedicated solely to the professional training of the individual.

- No significant hierarchies are necessary for the academic structures, as they limit the development of the student and only contribute to the preservation of the more traditional forms of education.

- Flexible elementary education model focused on academic, and emotional training, tailored to the needs and personality of each student. A significant effort is dedicated to the teaching of everyday skills.

- Open-ended and flexible higher education model that permits the individual to develop their skills in tune with their personality, desires, and needs.

- No traditional examinations are necessary for the formation of the individual. Experience, tutorship, and peer review help the individual learn how to study and develop their skills.

- The artistic mindset can act as a perfect mediator between reason and emotion. By integrating such a mindset into the educational system, individuals can become more passionate and rational.

- Making the students a part of the construction and organization of the college through the democratic process is the best way to balance individuality and collectivity in an academic environment.

- Each academic institution can be no larger than 300-500 individuals, as growing beyond that size compromises its integrity and dilutes its identity.

What explanatory gap does this theory address?

- The difficulty of designing a sensible form of education that doesn't waste human potential.

__What does this theory provide to my dissertation?__

- An already proven model for the creation of a
  sensible form of education that utilizes the artistic
  mindset as one of its defining characteristics.

- A framework from which to design a sensible
  educational model that is in tune with human nature.

After having analyzed the history of the college, I can
conclude that most of their theories were proven to be true, but
that there was no place in mid-20th century America for an
institution dedicated to teaching individuals to think for
themselves, a fact that led to its eventual closure (Keough,
2013). We also have to seriously consider that the college
itself also had some significant shortcomings, the most relevant
ones being the institution's inability to obtain enough funds to
sustain itself, and the wear and tear its faculty suffered as a
consequence of utilizing an experience-based educational model
(Keough, 2013).

Nevertheless, and despite those shortcomings, I consider
that the Black Mountain College succeeded in creating an
educational model that utilized the artistic mindset and the
democratic process to help individuals form themselves both
intellectually and emotionally, helping them become passionate
yet rational, creative yet focused, individualistic and unique
yet empathetic and responsible (Keough, 2013). My literature
review has revealed that those are precisely the intellectual,
behavioral and psychological aspects that could help us overcome
the challenges of the future the most, and that is the main
reason why I have chosen these theories as the framework from
which I can develop my educational postulates.

In this regard, my goal is to take the Black Mountain College's educational theories as a parting point from which to conceptualize a new educational model that is useful to our time and situation as a species. To counter the shortcomings of the original model, I will utilize the opportunities provided by the emerging artificial intelligence, information, and communication technologies.

6.7 Hal Foster's theory on Contemporary Art

I choose the theories posed by *Hal Foster* because I consider that they provide an excellent critical analysis of the current state of the artistic disciplines, all while proposing alternative ways o conduct the artistic practices in a sensible way that is true to the nature of art and the contemporary world.

Main proponents

• Hal Foster

Main postulates

• Contemporary artistic disciplines suffer a crisis of identity, criticality, and creativity as a consequence of the extreme proliferation of artistic pluralism, globalized culture, and artistic commodification and speculation (Foster, 2015).

• The apparent goal of contemporary art is to conduct a form of social criticism with the goal of driving a positive social change (Foster, 2015 p. 130-139).

• Most contemporary art forms recycle late 20th-century participative forms of art to try to conduct that social critique. While most contemporary artists do have their hearts in the right place, this social critique tends to be conducted more as a form of popularity contest than as an actual critic, a tendency that only contributes to art commodification and speculation, at the expense of the impact, integrity, and cohesion of the artistic disciplines (Foster, 2015).

- Most contemporary artists believe that the social criticism they conduct is relevant and impactful, but in truth, there is nothing that contemporary art can do to conduct an effective social critic because contemporary society is conditioned and desensitized by the social networks, mass media, and the globalized culture (Foster, 2015 p. 130-139).

- The contemporary art market encourages the newer generations of artists to create works of art that are aligned with the public opinion established by globalized culture. If artists doesn't follow these postulates they are sidelined or canceled by the rest of the artistic community. As a consequence, most artists and artistic institutions only dare to mimic the work conducted by late 20th-century social artists, as this allows them to create artworks that are expected to be socially accepted and praised (Foster, 2015 p. 140-155).

- Ultimately, the influence of globalized culture paired with the investor-defined landscape of the art markets devaluates the artistic disciplines and the role of the artists. If this tendency is not changed, the artistic disciplines risk being completely diluted and assimilated by globalized culture (Foster, 2015).

- There is nothing that contemporary art can do against globalized culture but to conduct an act of survival. All that independent thinking artists can do in this regard is to conduct their work as a way to expose actuality, and thus have to elaborate a well-defined personal aesthetic, a work pattern that acts in tune with cognition, and a strong sense of personal and external criticality (Foster, 2015).

What explanatory gap does this theory address?

- The difficulty of conducting a critical and sensible examination of contemporary art and its relation with the globalized world.

What does this theory provide to my dissertation?

- A clear and proven definition of one of the core aspects of art: a subjective encoder of actuality.

- A framework from which to construct sensible artistic postulates in regard to the current state of contemporary art.

I consider that *Foster's* theories offer the perfect framework from which to conduct my study of the current state of the artistic disciplines, because they expose the more glaring problems present in them in a way that aligns with the goals of my dissertation, in grand part thanks to their defense of actuality as a form of refuge for independent thinking artists. I consider that these theories are as disheartening as they are realistic because personal experience has taught me that there is nothing that can be done against the influence of globalized culture apart from trying to survive and maintain one's identity, a process that requires a constant defense of actuality that is revealing, exhausting and, to a very significant degree, depressing.

I also believe that these theories complement the other theories I have already explored in a very effective way: The theories posed by *Zallo* expose the workings and problems of globalized culture (Zallo, 2011), *Fuller's* theories indicate that globalized culture and the systems it is defined by are bound to eventually collapse as a consequence of extreme technological change (Fuller, 1969), the *Black Mountain College* utilizes the defense of actuality as an essential part of their

educational model (Keough, 2013), while the Bauhaus's theories regarding the relation between art and technology offer what is missing from Foster's postulates, a focus and role for contemporary art beyond conducting a mere act of survival by helping the emerging technologies be developed more sensibly (Invaluable, 2019).

Ultimately I believe that *Foster's* theories and postulates expose one of the essential aspects of art, that of being a process through which an individual can encode their personal perception of actuality (Foster, 2015 p. 140–155). It is evident that if contemporary art is to lose this aspect, it would be destined to be dissolved into nothingness. While it is true that art would more than likely recompose itself eventually, it would be potentially catastrophic to lose it in such a critical moment. It is only logical to think that, by preserving that essential part of art against globalized culture, as Foster suggests, when globalized culture finally collapses, it would be far easier for the artistic disciplines to reorganize themselves in a positive way if this act of survival is conducted now than if it was not.

That is why *Foster's* theories are vital in determining the theoretical framework from which to conduct my studies and construct my postulates. Nevertheless, I will complement these theories with other studies conducted on the subject of contemporary art.

6.8 The theory on the evolution of Life, Intelligence, and Consciousness as a Weak Emergent Behavior

It might seem strange at first that I would choose theories related to the fields of evolutionary theory, biology, and neurology to provide a framework for a dissertation conducted on culture, art, technology, and education. However, I consider that the context these theories provide is vital to this research project, for they can be utilized to conceptualize how the artistic, academic, and cultural disciplines could be hybridized in tune with natural evolution.

Main proponents

- Todd E. Feinberg

- Jon Mallatt

- Scott Jordan

- Marcello Ghin

- David Chalmers

- Christopher K. Tokita

- Corina E. Tarnita

- Robin Dunbar

Main postulates

- Life, Intelligence, and Consciousness can be explained as a scalar system of weak emergent behaviors of increasing complexity (Feinberg and Mallatt, 2020), (Jordan and Ghin, 2006, p.n).

- It is not truly possible to explain consciousness as a weak emergent because consciousness is inherently subjective (Chalmers, 1996, p.n).

- Evolutive emergent behaviors occur when a system composed of specific interacting parts reaches a critical stable complexity mass and is stimulated by an environmental change, forcing the system to adapt and causing the novel behavior to emerge as a consequence (Feinberg and Mallatt, 2020), (Jordan and Ghin, 2006, p.n).

- Evolutive emergent behaviors stabilize the system that has caused them to emerge by establishing a symbiotic feedback loop with its constituents (Feinberg and Mallatt, 2020), (Jordan and Ghin, 2006, p.n).

- The time required for a novel evolutionary behavior to emerge from a new system level is decreased exponentially with each increase in complexity, approaching a potential singularity in its more complex forms (Feinberg and Mallatt, 2020).

- Social behaviors and constructs can be explained as weak emergents (Tokita and Tarnita, 2020).

What explanatory gap does this theory address?

- The difficulty of explaining the evolution of life, intelligence, and consciousness as weak emergent behaviors.

What does this theory provide to my dissertation?

- A framework from which to conceptualize a sensible interdisciplinary emergent network that is in tune with the nature of evolution, understood as emergent behavior, and with the limits of our species.

These theories do not only offer extensive analysis and interpretation of evolution but do so in a way that can easily bridge these fields to the study of social structures and behaviors, thus providing an excellent framework from which to construct cultural and social postulates that are true to the nature of evolution.

Most significantly, these theories expose what conditions are needed for evolutive behaviors to emerge, and make evident, even if not directly indicating it, that such behavior could emerge from human-created systems and interactions if the necessary conditions are met (Feinberg and Mallatt, 2020), (Jordan and Ghin, 2006, p.n). If we consider the current state of the world and where it might be heading, it is not a big stretch of the imagination to believe that such behavior could emerge in the next decades as a consequence of human interaction reaching a critical mass, and of said mass being forced to adapt to the environmental changes caused by the emerging challenges of our time. However, if we also consider the self-damaging nature of contemporary globalized culture, we should be concerned about the potentially harmful impact such an emergent behavior could have.

This revelation also offers a solution: as *Tokita* and *Tarnita* demonstrate, if we can understand how positive evolutive emergents come to be, we can harness said knowledge to help us design a cultural and social environment that fosters the emergence of a positive evolutive emergent from human interaction (Tokita and Tarnita, 2020). This is why I have chosen the framework provided by these theories as a basis for constructing my cultural and social postulates. While it is evident that we won't be able to preemptively prove or disprove the potential emergence of a complex conscious mind as a consequence of human interaction reaching a critical point, we

can use our knowledge of evolutionary emergence to help shape social environments that generate positive emergent behaviors of their own.

In this context, it is also significant to mention the theories posed by *Robin Dunbar* regarding the human group sizes and their relation to emotional and social cohesion (Lumen, 2021). While not directly related to the field of evolutionary emergence, *Dunbar's* sociological studies complement the former by providing a bridge between the theories focused on evolutionary emergence and those that study emergent social interactions.

Nevertheless, it should be noted that it is not the aim of my thesis to prove or disprove any of these theories; my interest is that of obtaining a framework from which I can design my cultural, artistic, and educational postulates in tune with the nature of evolution. It is also important to mention once again that, while the conceptualization of an emergent human network inspired by natural emergent structures will be an important part of my research, such an endeavor will be conducted only to create a foundation from which further research into the field of evolutive social emergence could be conducted, as the actual designing of such a system far exceeds the focus of this dissertation.

7 Arguments
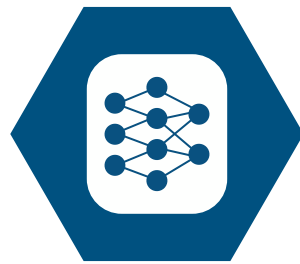
7.0 Introduction to Arguments

This chapter of the dissertation contains a series of arguments that address my posed research questions in a contextual manner. Combined with the information provided by the literature review, these arguments provide the context and foundation necessary to sensibly evaluate how art, culture, and academia could be redefined in the face of *The Machine at the Crossroads*, an analysis I'll utilize to shape my postulates.

The first of these arguments, titled ***The Machine at the Crossroads***[7.1], provides a unified overview of the opportunities, challenges, and risks the future could bring forth, and provides a context in which to build the rest of the arguments. The second argument is titled ***Offsprings of Nature***[7.2] and analyzes the defining characteristics of our human nature with the goal of constructing a framework from which to understand our relationship with the crossroads. ***A Short-Sighted Leviathan***[7.3] is the third argument, and analyzes the nature of the contemporary human civilization in the context of the crossroads, evaluating our current readiness level against it. The last argument, titled ***In Search of Synthetic Gods***[7.4], explores the currently emerging plans to counter the challenges posed by the future.

7.1 Argument I: The machine at the crossroads

I define *The Machine at the Crossroads* as a hypothetical upcoming point in time that could unfold at any point after the midpoint of the 21st century in which the challenges, threats, and opportunities posed by the new emerging technologies, the debts we have accumulated as a species in the last 10.000 years, the natural challenges of the world, and the evolutionary novel behaviors that could emerge from human-caused interactions, would converge in a way that would present our species with a set of critical and unavoidable choices that would define its future, for better or worse.

I do not define this event as a concrete moment but rather as an escalating succession of emerging challenges, risks, and opportunities that will unfold through the short to mid-term future. While I consider that each of those singular occurrences will more than likely put the human civilization to the test one way or another, I argue that it will be the convergence of said events reaching a critical mass that would unfold a situation in which our species would have to choose a definitive and sensible path to follow, at the risk of becoming obsolete or going extinct otherwise.

I identify this event as a crossroads because I argue that it will present us with a large number of paths to follow, with only a small number of them allowing for the continued existence of our species in a way that would allow us to maintain our current identity and nature. However, I also argue that finding and following one of these humanist paths is not the only choice we have, as other paths would also lead to our species successfully venturing past the crossroads, albeit with a different, although not necessarily worse, nature and identity. Nevertheless, I argue that not all the integrants of the human civilization should choose the same path to follow because, from an evolutionary point of view, diversity is always preferable to homogeneity as long as said diversity is not self-destructing. Ultimately, I also argue that following any path that would assure the continued existence of our species would be preferable to its extinction, but that certain extreme paths should only be taken as a last resort.

The Machine that I identify in this argument refers to technology in itself, both as an extension of ourselves and as an entity of its own, as I argue that the development and utilization of the new emerging technologies, is the most significant among them Artificial Intelligence, will more than likely play a key role in the resolution of the crossroads. I argue that because of their nature, these technologies could as much help us overcome the crossroads as they could cause the obsolescence and extinction of our species. Ultimately, I also argue that, because of the Nature of Ai specifically, this crossroads could represent an influx point in which technology evolves to become its own self-sustaining entity, for better or worse.

What research questions does this argument address?

- This argument is posed as a way to contextualize and expose the nature of the challenges, risks, and opportunities the future could bring forth and thus addresses ***all my research questions***[3.5] by providing a foundation from which to construct my main and conceptual postulates.

Which ones are the constituents that could shape *The Machine at the Crossroads*?

- While there are many unique challenges, opportunities, and risks that could shape the crossroads, I argue that the most relevant of them can be grouped into five distinct categories: The opportunities, challenges, and risks posed by the New Emerging Technologies, the challenges posed by Emergent Natural Events and Disasters, the challenges and risks posed by The many Debts we have Accumulated as a Species, the occurrence of Black Swans (highly impactful yet highly improbable and unpredictable events), and the occurrence of White Swans (highly impactful yet predictable events that are ignored due to their high level of improbability).

- We also have to account for the possibility of an Evolutive Emergence occurring as a result of human interaction reaching a critical sustained mass in the foreseeable future. If this event were to happen, it would significantly define the nature of the crossroads.

When would *The Machine at the Crossroads* occur*?*

- While I argue that the less impactful aspects of this crossroads are already becoming evident throughout most of the world, I consider that the more severe ones will not start to unfold until the midpoint of this century. From that point onwards, I argue that each passing year will increase the probability of those aspects converging into a critical mass, causing the emergence of the actual crossroads as a result. I also consider that how quickly the crossroads emerges will be determined in grand part by the development of Artificial Intelligence, and especially of its more complex forms, as these technologies could accelerate the unfolding of every other event because of their capacity to speed technological development.

The Black and White Swans

The occurrence of Black and White Swans.

The New Emerging Technologies

The opportunities, challenges and risks posed by the new emerging technologies.

The Debts of our Species

The many debts we have accumulated as a species. Forces us to choose with haste, at risk of going extinct otherwise.

Emerging Natural Challenges

The challenges posed by the occurrence of natural events and disasters.

The Crossroads

The many paths the future will open to us, for better or for worse.

The Machine at the Crossroads
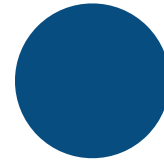
The convergence of these challenges into an event that will define the future of our civilization.

An Evolutionary Emergence

The occurrence of an evolutionary emergence as a consequence of human interaction.

The Machine at the Crossroads, outline

7.1.1 Of Black and White Feathers: *The Black and White Swans*

In order to properly understand the concept of *The Machine at the Crossroads*, and of the challenges posed by the future as a whole, we have to address one of the most significant aspects of the future in itself: that it is, by nature, unpredictable. This might seem to come as an obvious or superfluous remark, but I consider that analyzing the implications of this fact is of key importance for the matter at hand.

Something that I already knew before starting to work on this thesis, and that has only become more evident after concluding the literature review, is that planning for the future, no matter the scale in play, is bound to encompass multiple aspects of life and a multitude of viewpoints, personal experiences, and expectations. This means that, while one can theoretically plan for its own future with a relative amount of predictability and objectivity within the framework set by everyday life, the same can not be said for when we try to plan for the future of a group of people, and much less so for that of the nation, or that of our whole species. The more elements and individuals a possible future encompasses, the harder it is to predict how it might unfold, and the less legitimate it is for a single point of view to remain valid as a lens to prepare for said future.

If we then account for the impact of **Black Swans,** as explained by *Nassim Nicholas Taleb* (Taleb, 2010), we can also assume that any prediction made about the future, no matter the scale at play, is bound to be heavily compromised as a framework for the creation of a plan for the future, as a single impactful unexpected event would invalidate any concrete plan based on those predictions. A clear example of Black Swan, albeit a largely positive one, in this case, would be the emergence of the internet in the closing years of the 20th century, as it was a world redefining occurrence that almost no one managed to predict in a complete fashion.

What is a Black Swan Event?

- First, it is an outlier, as it lies outside the realm of regular expectations because nothing in the past can convincingly point to its possibility (Taleb, 2010, p. 20).

- Second, it carries an extreme impact (unlike the bird)' (Taleb, 2010, p. 20).

- Third, despite its outlier status, human nature makes us concoct explanations for its occurrence after the fact, making it explainable and predictable (Taleb, 2010, p. 20).

In his book, Taleb emphasizes that we humans tend to do our utmost to try to understand the workings of the world we inhabit, and that said thirst for knowledge tends to cloud our judgment when it comes to accepting that, no matter how much we try to analyze reality, we won't be able to understand it completely, and much less in a truly objective way, because there will always be outliers that will scape from our analysis

of it. Taleb defines this as **Platonicity**, *the act of believing to know more than what one actually knows* (Taleb, 2010, p. 29). However, the author indicates that Plato's empiricism is of great relevance and practical use when it comes to studying reality, pointing out that it is only because the scientific community tends to be biased against studying unusual occurrences that this approach is compromised.

In short, we can say that human society as a whole is conditioned to learn from experience, which is a very effective approach to studying and understanding the universe, as long as the events from which the experience emanates are not too harmful.

A clear symptom of this behavior is that most of contemporary society (and of human society through our history as a species) is built around the expectation of the common, a behavior that goes a long way when it comes to creating an orderly and efficient civilization. However, it is a behavior that makes us highly vulnerable to impactful unexpected events, both in a small, personal, scale and one that concerns an entire society. In turn, this behavior causes the other type of Swan to occur, **The White Swan**. Taleb defines the White Swans as those impactful events that, while being predictable, are not accounted for because their occurrence is so improbable that it would be unreasonable from an efficiency standpoint to preemptively counter them (Bloomberg, 2020). No concrete definition for the White Swan exists yet, however, as the concept is still relatively new, we can easily mimic Taleb's definition of the Black Swan to frame it in a similar way.

A clear example of a White Swan would be the occurrence of the Coronavirus Pandemic of 2019. Many experts had warned about the potential emergence of a worldwide pandemic since the beginning of this century, remarking on the need to take preemptive action against such an eventuality. In large part,

those warnings were ignored because the cost of taking preemptive action against a hypothetical pandemic was considered too excessive from an efficiency point of view. The end result was that, when the pandemic emerged, no country was prepared for it, one way or another.

What is a White Swan Event?

- First, it is also an outlier, because, while it is predictable, it has a very low probability of occurrence and is thus largely ignored in the name of system efficiency. However, unlike the Black Swans, White Swans could be prevented if enough resources are dedicated to said prevention.

- Second, it also carries an extreme impact, like the Black Swans.

- Third, human nature makes those responsible for the occurrence of White Swans deny their responsibility, delegating it to others or the system itself.

Why are the Black and White Swans important to the Machine At the Crossroads?

- The Black and White Swans provide a framework from which we can explore and understand the nature of the elements that will define *The Machine At the Crossroads*. This is possible because, due to the largely predictive or ideologically narrow dispositions of contemporary civilizations, we can expect that most of the events that would emerge from the relationships formed between the constitutive elements of the crossroads and our species will more

than likely take the form of either Black or White Swans, for better or worse.

- Ultimately, what we have to learn from the nature of Black and White Swans is that, while the future can not be truly predicted, it is primordial that we plan for it in a sensible way that accounts for both the impactful predictable yet not very probable events, and the impactful unpredictable events.

- As Taleb points out in his book, the impacts of Black Swans can be countered to a large degree with sensible pre-planning, and through the nurture of an adaptable mindset instead of a narrow one (Taleb, 2010, p. 273).

- On the other hand, the emergence and intensity of White Swans within a specific part of society is determined by the insensibility and short-mindedness of those who organize said society. By encouraging individuals, and especially those who have power over others, to think long-term and to act sensibly and empathically, we could prevent the occurrence of White Swans altogether (Bloomberg, 2020).

- By analyzing the nature of Black and White Swans we can better conceptualize the nature of the events that will define *The Machine At the Crossroads*, and thus conceptualize how art, culture, and academia could help us overcome it sensibly.

7.1.2 The Machine that waits: *The New Emerging Technologies*

The ability to develop and utilize technology has always been a key aspect of our species, as it represents our capacity to transform what we can learn from analyzing the universe into a practical set of languages, tools, and elements that we can utilize to interact with, and even manipulate, the environment and ourselves in complex ways, for better or worse. At first glance, *The new Emerging Technologies* might not appear to be that conceptually different from the other technologies we have developed throughout history. However, once one analyzes their nature and potential applications, it becomes evident that their impact will likely be unprecedented.

While thousands of different emerging technologies are currently under development in the world, most of them can be grouped within a series of specific technological groups: these groups are **Quantum Computing technologies, Narrow Artificial Intelligence, General Artificial Intelligence**, the **Internet Of Things Technologies**, the **Virtual Reality Technologies, Genetic Engineering, Cybernetic Engineering,** the **New Generation General Engineering Technologies,** and **Geoengineering.** Each of those technological groups has the potential to alter the nature of the world and ourselves in radical ways. Each one of them will offer a series of opportunities that we will be able to utilize,

challenges we will have to overcome, and risks that could cause the extinction of our species if they are ignored.

For the most part, the studying of these technologies is of contextual interest for my dissertation and thus is contained within its literature review; however, I believe that it would be appropriate to briefly mention their most significant characteristics in this chapter, especially in regards to the possibilities, challenges, and risk they entail, and how they could shape *The Machine at The Crossroads*.

Because of these technologies' experimental nature, it is impossible to predict when they will be made available to the general population. However, it is possible to guess, after having analyzed the literature that concerns their development, that the simpler forms of these technologies will start to enter general use by the end of the 2020s, with the more complex ones only becoming relevant after the midpoint of the century. It is, however, way harder to predict when the development of the more extreme forms of these technologies will conclude; thus, it would not be reasonable to expect their introduction to the general population until the later years of this century. As a form of a guide, each analyzed technology group in this chapter will include in their title a speculative date in regards to when we could expect them to enter general use.

Quantum Computing (2020s)

- The first technology group on this list is ***Quantum Computing***[5.1.2.1], which contains those technologies that concern the creation of quantum-based computing systems that are exponentially more powerful than conventional computers.

- Many of the other new emerging technologies will require the computational capacity offered by Quantum Computing to function.

- With that one being the main *opportunity* they offer, the main *challenge* these technologies pose is that of making their probabilistic nature compatible with our already existing deterministic computing and information systems. If this challenge is successfully overcome, Quantum computers will become a defining aspect of the world of tomorrow.

Narrow Artificial Intelligence (2020s–2030s)

- The second of these technology groups, **_Narrow Artificial Intelligence_**[5.1.2.2], involves the development of narrowly focused *Artificial Intelligence* and *Automation* technologies. The main **opportunity** these technologies offer is that of creating information processing and logic systems that could, if sensibly utilized, optimize, automate and enhance the handling of a very significant number of the tasks that compose most human disciplines on a case-by-case basis, exponentially increasing the productive capacity of each human being while reducing the workload necessary to complete repetitive tasks to almost zero, which entails the potential of liberating human beings from having to perform said tasks, allowing us to pursue vocational endeavors instead of having to perform repetitive or dangerous professions.

- The obvious **challenge** these technologies pose is that of having to reconcile their capability to automate professional tasks, especially repetitive tasks, with

our contemporary economic, professional, and
educational structures, as they could make
conventional professions obsolete in a relatively
short amount of time. The main **risk** they pose
derivates from that challenge and would take the form
of a White Swan: if societies don't preemptively
prepare for the emergence of ANI and Automation
technologies, they will face severe social and
economic upheavals resulting from conventional
professions becoming progressively obsolete in a
relatively short amount of time, as this would cause
massive unemployment.

General Artificial Intelligence **(2040s–2060s)**

- The third of these technology groups, ***General
  Artificial Intelligence***[5.1.2.2], concerns the creation
  of Artificial Intelligence systems that are
  cognitively comparable to a human being. The
  opportunity these technologies offer is the
  possibility of creating sapient synthetic beings that
  are intellectually equivalent to a human being, with
  the added benefit of them being cognitively tuned to
  manage complex networks and process extreme amounts
  of information, which means that they would be way
  more capable than humans when it comes to utilizing
  and administrating the many technologies that will
  emerge in the following decades. Above all else,
  however, AGIs will probably be able to conduct
  scientific research way more efficiently than human
  researchers, which will drastically accelerate the
  development of other emerging technologies.

- However, there are three main **challenges** AGIs pose:
  first and foremost, it is not yet certain that full

AGIs will become a reality in the foreseeable future,
in grand part because their development depends on
many other experimental technologies being developed
beforehand, such as *Quantum Computing*. Even then,
this challenge Is complicated further if we account
for the ethical and security-related considerations
that define the creation of potentially sapient
synthetic lifeforms that are capable of directly
controlling complex information systems. If their
development is conducted in a non-sensible way, which
is very likely if we consider that the nations and
corporations currently partaking in advanced Ai
development treat the process as a sort of arms race,
the consequences could be potentially catastrophic.

- However, because of the expected alien nature of
  AGIs, we can only speculate about what form those
  risks could take: the most popular if not necessarily
  plausible theories in this regard speculate that
  insensibly created and utilized AGIs could
  destabilize power structures worldwide to extreme
  degrees. In contrast, others theorize that AGIs could
  start to upgrade their own intelligence
  exponentially, leading to a technological singularity
  that could turn the human being completely obsolete.
  However, all these potential risks are speculative,
  and thus can only be theorized as potential, if
  extremely impactful, black swan events.

Internet of Things **(2020s-2040s)**

- The fourth technological group, the ***Internet of
  Things (IoT)***[5.1.2.7], focuses on the utilization of
  Augmented Reality, *Wireless communication,* and
  General Automation technologies to merge the

information networks with the physical realm into a seamless experience. The **opportunity** these technologies offer is that of synergizing those two aspects of our world, but the main **challenge** they pose is directly related to that opportunity. If the development of these technologies is not conducted sensibly, their utilization would only contribute to worsening the most relevant social and economic deficiencies of contemporary society.

- Most significantly, however, these technologies, if not sensibly developed and utilized, could also lead to an information overload, as most individuals would be unable to handle the amount of data these systems would require them to process. These potential **risks** can be counted as *White Swans*, and should not be ignored.

Virtual Reality (2030s–2050s)

- The fifth technological group, ***Virtual Reality (VR)*** [5.1.2.8], concerns itself with the creation of a complex virtual world and the hardware necessary to utilize them in an immersive way. These technologies offer us the **opportunity** to create extremely complex and fully immersive virtual realities that could potentially be indistinguishable from true reality, which would revolutionize all human disciplines.

- As with IoT technologies, the main **challenge** VR technologies pose resides in the difficulty of sensibly developing and utilizing them, as not doing so entails the **risk** of VR being abused as a form of existential escape, leading to the emergence of generalized extreme phycological problems around the world.

Genetic Engineering **(2030s–2050s)**

- The sixth technological group, ***Genetic Engineering***
  [5.1.2.9], entails the utilization of genetic material
  editing technologies to repair, modify, or enhance
  biological bodies. First and foremost, these
  technologies offer the **opportunity** of revolutionizing
  medicine in regards to not only humans, but all living
  forms, as they would let us modify the structures of
  organic bodies to an unprecedented level, allowing for
  advanced regenerative treatments and the eradication
  of many previously incurable genetic diseases,
  including cancer and even aging itself. However, the
  most significant potential these technologies offer
  resides in their capacity to modify and enhance the
  characteristics of biological bodies beyond their
  natural capabilities, which could lead to human
  augmentation and animal intelligence augmentation or
  even to the creation of entirely new life forms.

- Despite their obvious positive applications, however,
  these technologies also pose an obvious **challenge:** it
  will be extremely difficult, yet essential for the
  future of our species, that Genetic engineering
  technologies are developed and utilized sensibly, as
  doing otherwise could have catastrophic consequences
  not only for us but for life on the Earth as a whole.
  If insensibly used, these technologies pose the **risk**
  of unleashing terrors that we can only speculate
  about, that could range from the relatively less
  severe yet extremely disruptive social inequalities
  that could rise if Genetic Engineering health
  treatments are only made available to a few select
  individuals, to the existential threat that dangerous
  synthetic organic lifeforms, such as advance synthetic
  viruses, could pose.

***Cybernetic Engineering* (2030s–2050s)**

- For the most part, ***Cybernetic Engineering***[5.1.2.10], the seventh technological group, poses a series of **opportunities**, **challenges**, and **risks** that are comparable, if not equal, to those posed by genetic engineering, as both technological groups concern themselves with the repairing, modification, and enhancement of organic bodies. Cybernetics, however approach this task from a standpoint that attempts to integrate organic, mechanical, and computational systems in a synergic way that, while not as versatile as organic genetic engineering, could potentially allow us to seamlessly merge organic beings with mechanical devices, information networks, and computational systems, for better or worse.

***New Generation Engineering Technologies* (2020s–2060s)**

- The eighth group, ***New Generation Engineering Technologies,*** refers to emerging mechanical[5.1.2.12], industrial[5.1.2.13], logistical[5.1.2.14], energetic[5.1.2.15], and aeronautic[5.1.2.16] engineering technologies.

- While the **opportunities** these technologies will pose are extremely varied, the most significant ones are as follows: the advancements in mechanical engineering, especially those related to nano-technology, will allow for extreme miniaturization and assembly while also permitting the creation of new revolutionary meta-materials. In turn, those technologies will lead to radical advancements in industry, transportation, and logistics, while also permitting the emergence of revolutionary renewable

energy generation systems such as fusion energy.
Those advancements will also accelerate the
development of innovative and revolutionary aerospace
technologies, ushering in a new space age.

- Much as in the previous cases, the severity of the
  challenges and **risks** these technologies could pose
  will be determined by the sensitivity with which we
  develop and utilize them.

Geoengineering **(2020s-2060s)**

- The ninth technology group, **_Geoengineering_**[5.1.2.16],
  contains the technologies related to the repairing,
  modification, and enhancement of the geology,
  climate, and biosphere of a planet, technologies that
  could be utilized to repair the damaged biosphere of
  the Earth, and that could also be used to make other
  planets compatible to human life.

- While these technologies offer obvious **opportunities**,
  the main **challenges** they pose stem from the
  potentially catastrophic consequences their
  unreasonable use could cause. This **risk** entails that,
  in the worst-case scenario, extreme abuse of these
  technologies by competing factions could lead to the
  severe worsening of the climate and biosphere of the
  Earth, to the detriment of all the life that inhabits it.

As previously stated, all of these technologies have the
potential to radically alter the world on their own, for better
or worse, a fact that will largely be determined by how sensibly
these technologies are developed and utilized. However, it is
primordial to recognize the potential challenges and risks these

technologies could pose as whole and not only as individual entities, as their emergences will likely occur in parallel to each other, not in isolation. I argue that the unreasonable utilization of the new emerging technologies could lead to two potentially extremely detrimental scenarios: **a technological overload** and a **technological singularity.**

The Technological Overload

- Each of the emerging technologies has the potential to redefine the world and our species radically.

- Societies require time and foresight to adapt to these technologies appropriately.

- Because these technologies evolve in an accelerating manner, the amount of information they generate grows quicker than our ability to process it.

- If not solved, this scenario would eventually cause an information overload that would compromise our ability to utilize these advanced technologies.

While the emergence of these technologies will occur through the next fifty to one hundred years in a progressive way, current trends seem to point out that said emergence would be of an accelerating nature, which means that societies will have decreasingly small amounts of time to adapt to them as the century progresses. If we then consider the general difficulty that traditional hierarchical power structures have to adapt to technological innovation and progress as a consequence of the informational escalation said technological advancements cause, as explained by Buckminster Fuller in his book *Operating Manual for Spaceship Earth* (Fuller, 1969), we can theorize that the

development and utilization of the New Emerging Technologies will cause a **Technological Overload,** a world state in which the exponential system complexity increase and informational explosion caused by the sudden emergence of advanced technologies far exceeds the adaptational capacities of society, thus leading to a systemic collapse of social structures.

As *Buckminster Fuller* exposed, this is a problem that has accompanied our species since the beginning of the human civilization, with it becoming more severe after each significant technological leap. Each time a revolutionary technology has been developed, society has needed to specialize its organizational structures further in response to the increasing amounts of data generated by those new technologies. However, with each adaptational phase, it has become increasingly more challenging to specialize society further, causing those adaptational events to be progressively more tumultuous. As *Buckminster* poses, the last most significant of these adaptational events happened at the conclusion of the 19th century as a consequence of the emergence of wireless communication and industrial automation technologies. The emergence of this technology exponentially increased the information that society generated in a relatively short amount of time. As the dominant power groups that existed at the time became unable to administrate the world effectively, massive economic collapses followed soon after through most of the planet, eventually leading to the eruption of the first world war (Fuller, 1969, p. 13).

If we consider the current state of the world and the exponential increase in the demand for organizational complexity the new emerging technologies will generate, we can argue that, if the development and utilization of these technologies are not sensibly handled, the resulting technological overload might completely destabilize societies worldwide, as human organizational structures would be overwhelmed by the ensuring

exponential increase on the information they would have to handle, while the hyper-specialized general population would be completely incapable of adapting to the White and Black swans cause by the constant technological change.

For the most part, however, the Technological Overload can be classified as a White Swan event (or rather, as a series of White Swans), and thus it is possible to prevent its emergence, or at least diminish its potential negative effects if we preemptively prepare for it. This topic will be a recurring one throughout my dissertation, as I consider it to be one of the most significant challenges posed by *The Machine at the Crossroads*. However, we must tread carefully in this regard because if we take an unreasonable approach to solve this problem, we could potentially end up causing more harm than good.

Now that we have concluded the analysis of the first grand challenge posed by the New Emerging Technologies, let's proceed to the second one, the Technological Singularity.

The Technological Singularity

- Artificial Intelligence, Cybernetic and Genetic Engineering technologies have the potential to cause a self-sustaining, self-improving, technologically created being to emerge. Such an entity would be many orders of magnitude more intelligent than a human being but would have no empathetic or emotional connection to us.

- The emergence of such an entity would also cause technological development to become self-advancing exponentially, leading to a technological singularity. The human mind is in no way prepared to interact with such an event.

- Because of its complex nature, we can not truly predict if a Technological Singularity is possible; thus, its potential emergence should be considered an extremely impactful Black Swan.

While it is possible, if largely speculative, to conjecture about how a Technological Singularity could emerge, it is way harder to predict the consequences such an event could have, mostly because we can not even imagine how a sapient being that is various orders of magnitude more intelligent than us could behave, or what form the technologies such a being would create could take.

The concept of the Technological Singularity was coined by John Von Newman in the 1950s (Shanahan, 2015, p. 233): Newman posed that the creation of an intelligent synthetic being cognitively comparable to a human being could potentially lead to such an entity beginning to self-improve itself exponentially, thus causing a sudden and irreversible intelligence and technological explosion of a nature that would be completely alien to us, for better or worse. In 1993, Vernor Vinge refined and expanded on the concept, naming it a *Technological Singularity* (Vinge, 1993). Vinge expanded on the concept, posing that it could be caused not only by the creation of Artificial General Intelligence but also by the utilization of genetic and cybernetic engineer-based organic intelligence augmentation technologies. He remarked that, if a technological singularity came to be, it would cause the end of the human species as it would make us completely obsolete in an irreversible manner.

Vinge also posed that the best chance humanity would have to survive the singularity would be to enhance and fuse ourselves with technology, thus defending that only super intelligent post-humans could comprehend and live in a post-singularity

world. The concept of the singularity was then refined further by Ray Kurzweil in 2005 (Kurzweil, 2005), and by many other scientists and futurists ever since.

Regarding *The Machine at the Crossroads*, I argue that the Technological Singularity is probably the most dangerous of the challenges and risks it poses, not only because of the existential threat it entails but because of the alienness of its nature. The rests of the dangers posed by the crossroads are things we can comprehend, things we can prepare for, but there is simply nothing we can do as human beings that could prepare us against a singularity of this type. At the very least we can determine what technologies could provoke its occurrence, those being Artificial General Intelligence (AGI) and Intelligence Augmentation (IA), and we can also determine that, because of the experimental nature of these technologies, a technological singularity might simply never occur because these technologies might not become complex enough to provoke it in the first place.

Even so, that knowledge in itself offers little comfort if we consider that both AGI and IA could prove to be key not only to our survival of a technological singularity, but could also prove to be essential for solving many of the other challenges posed by the crossroads (being chief among them the Technological Overload). If the development of those technologies doesn't advance enough we might not be able to solve those other challenges, which could be fatal to our species on its own. Nevertheless, as Vinge explains (Vinge, 1993), it is also important to recognize that there is already a clearly determined path we could follow to not only survive but potentially prosper, in a post-singularity world: the trans-human path into post-humanity. However, having said that, I argue that this is a path that not every human being would probably choose to follow, as it would entail leaving our

humanity behind in favor of a largely new and more complex nature, for better or worse.

I argue that there are other paths we could follow to overcome the singularity, more humane paths, as my studies of evolutive emergence have revealed that a positive human evolutive emergent could potentially serve as an intermediary between the human species and post-singularity entities. While not an aspect of my core postulates, as those are related to art, culture, and academia in a more concrete manner, conceptualizing how such a positive emergent mind could come to be thanks to sensible cultural evolution will be the main topic of the conceptual chapter of this dissertation.

Ultimately, I argue that the Technological Singularity entails the best and worst that technology has to offer, and represents the logical conclusion of what could happen if we relegate the solving of the crossroads to technology (The Machine) itself. We know that it might not occur at all, but we also know that if the conditions for its occurrence ever materialize, it will almost certainly occur. This Singularity is one of the greatest Black Swans, and solving it will likely require us overcoming the crossroads in a sensible way. Not doing so could lead to our obsolescence and extinction in ways that we can not even imagine.

Why are the New Emerging Technologies important to the Machine At the Crossroads?

- These technologies have the potential to cause some of the most significant opportunities, challenges, and risks that could shape the crossroads, and thus represent both the best and the worst of what the future could offer.

- It is becoming increasingly evident that, despite their potential dangerousness, we will have no choice but to utilize them if we want to even have a chance at solving some of the most dangerous challenges posed by the other elements that compose the crossroads, all while knowing that, if said utilization is conducted in an unreasonable way, we risk becoming obsolete as a species, or even going extinct.

- The New Emerging technologies, but especially those related to Artificial Intelligence, Cybernetics, and Genetic Engineering, also have the potential to transform technology itself into an independent entity of its own, for better or worse.

- Ultimately, however, I argue that if we want to venture into the future and evolve as a species we will have to develop and utilize these technologies, so fostering sensibility in regard to their development and utilization will be key for the future of our species. I pose that a sensible form of culture, art, and academia could help us accomplish this goal.

7.1.3 The Beast At Our Back: *The Debts of our Species*

There is much that can be said about what our species has accomplished in the last 100.000 years, both good and bad, and it is common for us to argue about the nature and morality of the acts that have allowed us to become what we are. From my personal point of view, I argue that many of those acts, such as the abandoning of our original nomadic ways in favor of a sedentary lifestyle were logical as they permitted the emergence of civilization, while others, like the adoption of a hierarchical organizational system, where questionable yet necessary for their time, as those systems proved to be vital for the emergence of advanced civilizations.

However, I argue that the most extreme and amoral of the choices we have made through our history prove that we have not yet completely evolved past our primitive nature, as what sensible civilization could ever possibly be proud of allowing the relentless and unnecessary exploitation of world and most of its inhabitants in favor of a select number of individuals? of conducting war and genocide of any kind? of eradicating or assimilating other cultures out of disdain, envy, or fear? or of utilizing technology not to make the world a better place for all, but of using it to perpetuate and enhance our most primal behaviors senselessly?

Are we what we are despite those extreme acts, or because of them? I guess that it is up to each individual to answer that question, but what I dare to say is that each of these acts, no matter how necessary they might have been or not, imposed a debt on our species, a debt that we will have to pay eventually, one way or another, a debt that becomes increasingly larger with each year that we refuse to pay it. To be frank, it can be argued that we have never liked to be accountable for our most questionable actions, especially in regards to those actions that could cause long-term side effects, as their original perpetrators are already long gone when the time to repay the accumulated debt finally comes, but at the end of the day, and even if most of those debts were caused by the actions of a few individuals, their repayment has always been, and will always be, the responsibility of the whole of our species.

It is true that we have managed to repay some of those debts throughout our history, but it is just as true that we have decided to ignore the most important ones. Perhaps we have decided to do so because we don't feel like we are responsible for the acts that caused them, perhaps because our fear of them has paralyzed us, or simply because we prefer to continue living as we do instead of making the sacrifices necessary to repay them. Nevertheless, the time to repay those debts is running short, and if it runs out completely, we will be forced to repay them with an interest so high that it might as well end our species. While the list of specific debts is extremely extensive, only the most significant of them can be considered a threat to our existence, allowing us to group most of the less significant ones around those that are critical.

The critical debts we have accumulated as a species are as follows: the **Destabilization and Degradation of the Earth's Biosphere and Climate**, the **Proliferation and Normalization of Unsustainability**, the **Proliferation and normalization of extreme Hierarchical Organization and Specialization**, the **Decay of Human**

Genetic Diversity, the **Decay of Human Cultural and Ideological Diversity**, and the **Proliferation of Social Inequality**. Much like the emerging technologies of our time, these debts entail a series of challenges and risks, but unlike the former, the latter do not offer any form of opportunities whatsoever. Simply put, these debts are problems we have to solve before they become too complex and dangerous to be solved, at the risk of going extinct if we don't fix them in time.

While there exists no concrete critical point of no return in regards to fixing these problems, or in regards to when the most severe consequences of ignoring them would start to appear, as the emergence of these events would largely be progressive, most experts seem to agree that we might have little more than 50 years if we want to fix them in time. However, this timeframe should be understood as a loose estimation, not a prediction, but should be enough to allow us to frame these debts and problems within the broader challenge posed by *The Machine At the Crossroads*. As with my analysis of emerging technologies, the finer details that concern the studying of the debts that we have accumulated as a species are contained within the literature review of this dissertation. What follows is an analysis of these debts in the context of the crossroads.

The Destabilization and Degradation of the Earth's Biosphere and Climate

- This debt is probably the most evident one on this list: our continued senseless exploitation of the Earth's natural resources, summed to the prolonged utilization of environmentally damaging technologies, has very severely damaged the planet's biosphere and climate, driving it dangerously close to a point that, if surpassed, would make it largely uninhabitable for our species (NASA, 2021). This *risk*

must be considered an existential threat to the whole of our species.

- Solving this problem will be very **challenging**: it will require the reconciliation of our still largely primitive and senseless behavior in what concerns the acquisition of resources and the utilization of technology, with the critical state of our world.

- While the new emerging technologies will likely prove to be essential in solving this debt, using them in an unreasonable or hasty way could make matters even worse. The core challenge thus resides in promoting and achieving sensible and responsible behavior in regard to the treatment of our world before the problem becomes critical.

The Proliferation and Normalization of Unsustainability

- This debt is closely related to the previous one, yet it is complex enough to be considered a debt of its own: the proliferation and continued utilization of unsustainable industrial, economic and reproductive practices throughout the entirety of human history have in grand part made us dependent on said practices as a requirement to keep civilization from crumbling, even when more sensible alternatives are available, either because our organizational and power structures have grown accustomed to said practices, or because we are afraid that embracing more sustainable ones could compromise our quality of life (Snyder, 2020).

- The main **challenge** this debt poses is clear: our civilization needs to adopt sustainable practices with due haste, but we are still largely dependent on

unsustainable ones to sustain ourselves. As explored
by *Buckminster Fuller* and *Jaques Fresco* in *Operating
Manual for Spaceship Earth* (Fuller, 1969) and *The Best
That Money Can't Buy* (Fresco, 2018) respectively, we
already have the scientific and sociological
knowledge necessary to adopt sustainable industrial,
economic, and social models, but the difficulty of
doing so resides in our reluctancy to abandon our
unsustainable ways. I argue that only a sensible form
of culture, art, and academia could provoke such a
change.

- We have been accumulating this debt since the early
  days of civilization, and it is the main contributor
  to the emergence of climatic and ecological
  degradation, but it also poses another extreme ***risk***:
  if our population grows past what our world can
  support resource-wise, and we do not move away from
  unsustainable industrial and economic practices, we
  might end up exhausting those resources to a point in
  which they can no longer sustain us, thus endangering
  our entire species.

*The Proliferation and normalization of extreme Hierarchical
Organization and Specialization*

- This debt is less evident than the previous ones, yet
  it is no less dangerous: it can be argued that, in
  order to progressively increase in complexity through
  time, human society has had no option but to embrace
  organizational structures that are increasingly
  hierarchical and specialized as a way to counter our
  inherent biological, social and phycological limits.

- It can also be argued that, while this behavior was essential for the emergence of civilization, it has become increasingly less effective since the advent of automation in the late XIX century and advanced computerization in the late XX century, as those technologies can compensate for those weaknesses by themselves.

- With each significant technological leap, the inner workings of societies have largely become increasingly hierarchical and specialized, even in those nations in which the political structures have become more open and democratic. However, it is evident that hierarchical and specialized organizational structures have demonstrated to become increasingly more vulnerable to the challenges posed by technological progress with each significant technological leap as a consequence of their inability to cope with the exponentially increasing levels of information generated by technological evolution, a topic that Buckminster Fuller explored in detail in the early chapters of his book *Operating Manual for Spaceship Earth* (Fuller, 1969 p. 1-14).

- Beyond its relationship with technological progress, extreme hierarchical and specialized organization limits the adaptational capacity of societies against unplanned or unforeseen events as a consequence of perceptive compartmentation and responsibility delegation. In practice, this means that the continued proliferation of these organizational structures has progressively dimmed our ability to counter White and Black Swans, something that could prove to be fatal in the face of the crossroads, both on a personal and social scale.

- I argue that, while hierarchization and specialization will likely always be a defining aspect of human society because of our nature, growing away from utilizing extreme hierarchical and specialized organizational structures in favor of using less specialized systems with the help of the emerging computing and communication technologies will be essential for our future, as not doing so could compromise our habitability to overcome White and Black swans, thus making the crossroads unsolvable as an ultimate **risk.**

- The **challenge** this poses is significant, as these structures are embedded with our organizational systems, academia, and culture. I argue that this problem can be solved only through fostering a more sensible form of culture, art and academia.

The Decay of Human Genetic Diversity

- Arguably, this is one of the most depressing debts we have accumulated as a species, even if it is also one of the easier ones to explain: since the origins of our species, but especially after the foundation of the first civilizations, we have progressively reduced the genetic diversity of our species.

- As studied and explained by *The Genome Diversity Project*, there are many factors that have contributed to this development, from the significant population shrink that our nomad ancestors suffered as a consequence of having difficulties in overcoming the physical challenges posed by departing Africa and spreading through the world 60.000 years ago paired with the genetic diversity decay caused by moving

form an environmentally diverse continent to less diverse ones, to the many cases of xenophobia driven indirect and direct racial purges that have defined our last 10.000 years. Ultimately we can assert that, with the exception of African-born genomes, our genetic diversity has decayed to a critical point (Gibbons, 2009).

- The main **risk** this debt poses is that of leaving our species extremely weakened in the face of unforeseen extreme diseases, as our reduced genetic pool might prove to be too homogeneous to keep most of us from perishing, thus causing our extinction (Clements and Casani, 2016).

- The **challenge** this debt poses is that of increasing our genetic diversity through the fostering of a more sensible form of diverse culture, something that we can assume won't be an easy thing to accomplish because, despite the many significant advances we have achieved in the last decades in regards to racial and cultural integration, the homogenizing effect of cultural globalization, summed to the progressive decay of reproductive rates in developed countries, have decreased that genetic diversity further.

- Genetic engineering will more than likely end up playing a key role in deciding the future of the genetic diversity of our species: a sensible use of the technology could revitalize said diversity very significantly, while one at the service of globalized culture could have the opposite effect, homogenizing our genetic pool even further.

The Decay of Human Cultural and Ideological Diversity

- This is another of the most depressing debts on this list, and while not directly related, it has a lot in common with the decay of our genetic diversity.

- Originally our culture was simple and limited to the tribal scale, a limit set by our environment and biological nature. After the spreading of our species through the world, and as a consequence of the emergence of agriculture and animal husbandry, the first complex cultures and ideologies rose, with a cultural group emerging for each environmentally distinctive area of the world. This process was uneven, with those environments more appropriate for farming and animal husbandry giving rise to more complex cultures than those that were less appropriate. In general terms, the Eurasian region proved to be the most adequate for fostering the emergence of advanced civilizations (Diamond, 2013,p. 85-176).

- Terrain transversality also played a key role in permitting or curtaining the propagation of culture. The areas that were easier to transverse permitted culture to spread quickly, while those regions that were harder to transverse curtained the propagation of culture. Until the late classic era, most civilizations existed in relative isolation and had little contact with one another. However, the development of advanced sea sailing in the late classic era changed this balance forever, as it caused the advent of long-distance trade, extra-national king-making, conquest, large-scale religions, and imperialism. Over the last 2.000 years, these behaviors have contributed to the decay

of human cultural and ideological diversity, with
each significant innovation in the field of
communication accelerating the process. Because of
the influence of culture and the traditionally
hierarchical and specialized nature of human
organizational structures, this process has also
homogenized the psychology and personalities of
individuals, further decreasing our adaptational
capacities (Diamond, 2013),(Anheier, 2020).

- History has demonstrated that too much cultural
  diversity can be dangerous as it causes the rise of
  internal conflicts. However, history has also
  demonstrated that extreme homogeneity is just as
  dangerous as extreme diversity as it compromises a
  species' adaptational capacity against unforeseen
  events and limits its ability to innovate. This is
  precisely what happened to the ancient Chinese empire
  in comparison to the civilizations that rose in the
  Mediterranean region. Because the Chinese region and
  its surrounding areas were way easier to transverse
  than those that defined Northern Africa, Europe, and
  the middle east, the Chinese empire managed to
  largely homogenize the culture of their inhabited
  region and its surroundings, leading to its cultural
  and technological stagnation (Diamond, 2013,p.
  322-334).

- Currently, human cultural and ideological diversity
  is reaching a critical point of homogeneity as a
  consequence of the influence of mass media, the
  internet, and cultural globalization. If this pattern
  is not corrected, we **risk** stagnating our capacity to
  innovate, while also risking becoming almost
  incapable of reacting against unforeseen or unplanned

events, a defining characteristic of most of the challenges that form *The Machine At the Crossroads*.

- The **challenge** this debt poses is that of fostering the emergence of a sensibly and diverse cultural renaissance that is aligned to our human nature and the nature of technology in a world defined by the already existing western globalized culture and the emerging eastern globalized culture.

The Proliferation of Social Inequality

- The last debt on this list is also the most saddening one: despite the many technological advancements and social achievements we have accomplished throughout our history, Social inequality has always been, and still largely is, a defining characteristic of our species. There are many factors that contribute to the proliferation of this behavior, but I argue that the main contributor has been our inability to fully reconcile the limits of our body and mind in regards to administrating and processing large amounts of information with the necessity of creating the complex organizational structures needed to shape advanced civilizations.

- As explained by *Buckminster Fuller* in his book *Operating Manual for Spaceship Earth* (Fuller, 1969 p. 1-14), the emergence of advanced technologies made this problem worse instead of solving it, because those in power insisted on maintaining the originally created organizational structures for personal gain, even if technology would have allowed us to grow past those limits otherwise, as the social changes necessary to foster that progress would have left

them largely powerless. Throughout our history, this
behavior has caused the progressive widening of the
social and economic gap, up to a critical point.

- As explored in the literature review, the richest
  individuals in the world (those with more than 1
  million dollars in their possession) amount to 1.1%
  of the Earth's population and hold 45.8% of the
  global wealth, those on a wealth range between 100K$
  and 1M$ amount for the 11.1% and hold 39.1% of the
  globals wealth, those on a wealth range between 10K$
  and 100K$ amount for the 32.8% and hold 13.7% of the
  globals wealth, and those on a wealth lesser than
  10K$ amount for the 55.0% of the population and hold
  1.3% of the globals wealth (Deshmukh, 2021).

- Even if in the last decades it has decreased notably
  in developed countries, social, gender and
  educational inequality are very significant
  throughout the entire world, especially if we compare
  the populations of developed countries with those of
  developing ones.

- Solving human inequality won't be an easy task,
  especially if we consider the cultural acceptance it
  enjoys throughout most of our world. I argue that
  only by fostering a sensible form of culture, art and
  academia can we truly overcome this *challenge*.

- Ultimately, the *risk* this debt poses is that of
  furthering the proliferation of human inequality in
  the face of the other challenges, risks, and
  opportunities posed by the crossroads, something that
  could rise that inequality to extreme levels, causing
  extreme human confrontations in the process.
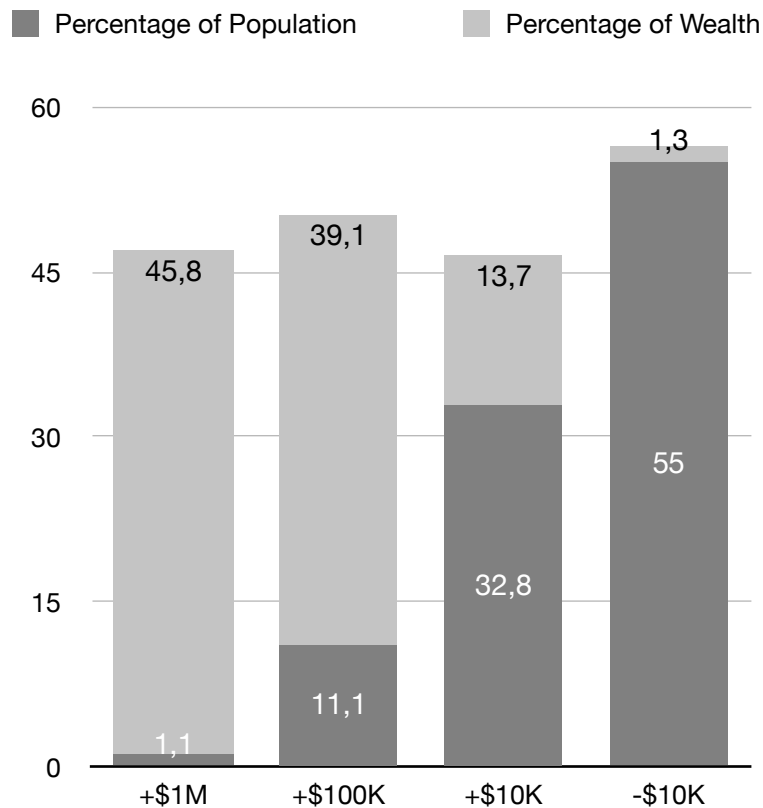
Distribution of global wealth accumulation, based on (Deshmukh, 2021)

While all of these debts could potentially heavily disrupt or even destroy human civilization if we don't solve them before their respective points of no return arrive, their malleable nature has allowed us to delay their payment by making small concessions in their favor throughout our history. However, the potential consequences of failing to solve these debts have increased with each passing century, thus we can argue that all this process has accomplished is that of mortgaging our future. Many still seem to believe, perhaps out of greed, or perhaps because of simple ignorance and perceptive dissonance, that this would still be the best way to deal with these debts in the present day, as trying to fix them in a substantial way could potentially break the status quo that defines the world, while

taking timid actions to solve them in a partial manner would let us keep the status quo intact at the expense of the future generations once more.

This is an approach that, while disheartening and ridiculous, has worked so far, but I argue that we are finally running out of time. The time to pay for each of these debts is coming short, as they are reaching such a critical point that further delaying their payment is just not feasible. In a normal scenario, as the time to pay these debts would be unique and separate from each other, we would solve them one at a time, thus minimizing the disruption that taking those actions could have on social stability. However, because of the encroaching nature of *The Machine At the Crossroads*, we can expect that the final, unavoidable collections of these debts will happen at some point in the next eighty years, concurrently with the rest of the challenges that define it.

Simply put, the crossroads will force our hand, leaving us with no option but to solve these debts with haste, at the risk of their cost being collected in full at the worst possible time. Even more so, this situation poses a challenge of its own because the pressure generated by the imminent collection of the debts will keep us from being able to slow down in the face of the approaching crossroads, further accelerating its arrival.

Why are these debts important to The Machine At the Crossroads?

- These debts have the potential to cause some of the most significant challenges and risks that could shape the crossroads.

- They represent our accumulated responsibilities as a species and, if ignored further, could cause our extinction because the consequences of neglecting

those responsibilities would finally materialize at
the worst possible time.

- They accelerate the arrival of the crossroads and
  leave us with no option but to face it.

7.1.4 The Sword over Our head: *Emerging Natural Challenges*

For all the roles we will play in shaping *The Machine At the Crossroads*, it is easy to forget that nature could also have a lot to say about our future. After all, despite all the technological and social advancements we have accomplished, we are still largely at the mercy of nature, and it would be naive, and probably very dangerous, to not account for the challenges and risks it could pose in the context of the crossroads.

What all these challenges have in common, no matter how dangerous they might be, is that, while humanity might play a role in their emergence, their origin is completely natural. A very significant amount of them can be predicted, yet the uncertainty of their occurrence makes taking preemptive action against them unreasonable from an efficiency standpoint and thus should be classified as potential White Swans. A few of them, however, are almost impossible to predict; thus, there is little we can do to keep them from happening if they were to happen. In regards to those potential Black Swans, all we can do is hope that they do not occur at all.

Nevertheless, nature is too complex for it to be feasible to analyze all the potential challenges and risks it could pose in the immediate future, so it is only possible to expose the most significant and potentially dangerous ones, as the studying of

the rest goes beyond the scope of this dissertation. I have managed to identify the most significant groups of emerging natural challenges that could become a key aspect of the crossroads: the **Emergence, or Reemergence of Extreme New Diseases**, the **Occurrence of Extreme Geological Disasters**, and the **Occurrence of Extreme Space-born Disasters**.

The Emergence, or Reemergence, of Extreme New Diseases

- A simple, yet potentially catastrophic emergent natural challenge: As explained by *Bruce W. Clements and Julie Ann P. Casani* (Clements and Casani, 2016), evolution might give birth to a new type of potentially extremely dangerous disease capable of causing the extinction of most of our species.

- While this threat has accompanied us through all of our histories, certain of the activities we have conducted in the last century have significantly increased the chances of its emergence and potential dangerousness: on the one hand, human-caused human warming has debilitated the Earth's permafrost so much that a pre-human era disease against which we have no defenses whatsoever could reemerge into the world. On the other, our abuse of antibiotics could lead to the natural emergence of an antibiotic-resistant super-bug, bringing us back to the pre-antibiotic era and causing uncountable deaths in the process.

- Above all else, however, the decline of our genetic diversity also contributes to this threat is way more significant than it should be, as our reduced genetic pool dramatically reduces our chances of surviving a super-pandemic (Gibbons, 2009).

- Besides that, the development of high-speed international transportation systems has also substantially increased the propagation speed of diseases, dramatically reducing our reaction time against them (Clements and Casani, 2016).

- The **challenge** this threat poses is that of recognizing the **risks** that the potential emergence of new super-diseases could pose for our species as a whole, thus driving us to take sensible preemptive action against them. The still ongoing coronavirus pandemic should serve as an example of what could happen if one of these super-diseases could emerge, with the difference that the latter would be significantly more lethal than the former.

The Occurrence of Extreme Geological Disasters

- Extreme geological disasters are as simple to understand as they are potentially dangerous: while largely stable and non-disturbing to life, the Earth's inner systems do, from time to time, disrupt the surface and its inhabitants. While most of these events are largely contained in a reduced area and do not endanger life on a large scale, some of them, while not that common, have the potential to threaten it on a global scale. Among these threats, a potential **Super-volcanic Eruption** is the most likely to occur.

- An eruption of this type blankets the entirety of the atmosphere with ash, blocking the sun for many years or even decades, and thus causes an extreme sunless ice age that starves most surface-born plants and animal species to death, forcing them to repopulate

the world from almost zero after the eruption ends. There are 20 super-volcanoes on Earth, and an eruption tends to happen every 100.000 years. Coincidentally that is more or less the time that has elapsed since the last eruption, which means that the next one could happen at any time.

- A study from NASA concluded that, if a super-volcano was to erupt in the present day, global food reserves would last for only 74 days. Fortunately, the same study posed that it would be possible to create a simple, If relatively expensive, water cooling systems that would cool the magma chamber of each super-volcano, indefinitely delaying their eruption while generating very significant amounts of geothermal power in the process (Cox, 2017).

- In order to counter this **risk***,* we must overcome the **challenge** of making this project a reality in a sensible way because, as is the case with any geo-engineering technology, misuse or abuse of the implemented system could have terrible consequences of its own.

The Occurrence of Extreme Space-born Disasters

- Much like Earth-born emerging natural challenges, their space-born counterparts should be considered among the most dangerous events that could potentially unfold in the foreseeable future. While the list of potential space natural disasters is extremely large, there are three potential occurrences that we should be concerned about above all else because of their relatively higher chances of occurring in the foreseeable future: the full

realization of **The Kestrel Syndrome**, the occurrence of an extreme **Solar Storm**, and the **Impact of a Large Scale Asteroid.**

- The realization of the Kestrel Syndrome would entail that, after nearly a century of deploying satellites in Earth's orbit up to a critical mass, a single collision among two of those satellites, or between a satellite and a piece of orbiting debris, could cause a destructive chain reaction that would end up destroying all satellites in Low Earth Orbit while also polluting the whole orbital plane with billions of extremely dangerous high-speed pieces of scrap, thus completely sealing our access to space until natural orbital decay cleans Low Earth Orbit in the span of a couple of centuries. This is an extreme **risk** that could potentially seal us from being able to venture into space for various centuries, the challenge it poses being that of developing sustainable space-born recycling and construction practices that would keep the Kestrel Syndrome from becoming a reality.

- The impact of extreme Solar Storms on the other hand would entail the sudden and almost total collapse of our orbital and planet-born energy and communication networks as a consequence of a high-intensity solar flare impacting our planet. While the storm would not damage living tissue, its electromagnetic properties would shut down electronic systems for many days or even weeks, severely damaging those systems that are vulnerable to electromagnetism, such as orbital satellites, power distribution networks, and domestic appliances. Needless to say, those nations with a heavy dependence on electronics and information systems would suffer the most in this scenario, as

they would be thrown back to the stone age almost overnight, thus leading the world in chaos, an extreme **risk** on all accounts (ESA, 2017).

- However, solar storms can be predicted, and we can also shield the most critical aspects of our planet-bound electronic systems from their effects. The **challenge** of doing so, as its custom, resides in the difficulty of convincing world powers to take expensive preventive action against an event that is not assured to occur in the short term (ESA, 2017).

- Lastly, we also have to account for the potential planetfall of a large-scale asteroid, which would, simply put, reduce the surface of the Earth to cinders. Even the impact of a mid-sized asteroid could be extremely damaging to life on the earth, especially if it were to fall into the ocean. As we simply can not **risk** such occurrences from becoming a reality it is essential that we create reliable asteroid detection and deviation system, a necessity that is met, once more, with a timid disposition from world powers, as they see little use in dedicating significant resources to countering a potential threat with such small chances of occurring. Nevertheless, overcoming this **challenge** will be essential for the future (ESA, 2017).

The Emerging Natural Challenges of our time can be considered a wildcard, but for what what concerns *The Machine at the Crossroads* it would be more appropriate to classify them as White Swans. We know why and how these events could come to be, we know what consequences they would have, and we also know how we can prevent their occurrence or, at the very least, mitigate their effects. However, our inability to exactly predict when

they could unfold, summed to a large number of resources that would be required to counter them preemptively, detracts most world powers from taking any significant action against them under the pretext of efficiency.

As is the case with most of the White Swans analyzed in this chapter, changing this perception is paramount if our species is to survive *The Machine At the Crossroads*. I argue that, while these emerging natural challenges are not assured to occur within the timeframe in which the crossroads would take place, the occurrence of a single one of them could be enough to make overcoming the crossroads unviable even if we manage to solve the rest of the challenges posed by it.

Why are these natural challenges important to The Machine At the Crossroads?

- While less likely to occur, each of these challenges has the potential to end our species one way or another.

- World powers are less likely to take preemptive action against them than against other emerging challenges because they are more conspicuous and easier to ignore.

- If ignored, their occurrence could make solving the crossroads impossible even if we manage to solve the rest of the challenges.

7.1.5 Into the world of tomorrow: *The Crossroads*
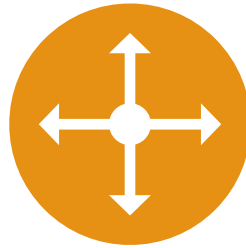
We have had to overcome many crossroads in the path we have followed as a species, and thanks to the decisions we made at those points, or despite them, we have managed to get to where we are. In general terms, the upcoming crossroads won't be that different from the previous ones, as it will simply be a moment in time in which the choices we have made through one era will converge to determine how the next one will be, but there are two main features that differentiate it in a very significant way.

On the one hand, the complexity of the entities, opportunities, challenges, and risks that will shape this crossroads is completely unprecedented, and the consequences that would stem from overcoming or failing to overcome the crossroads will also likely be various orders of magnitude more significant that anything we have experienced before, for better or worse. On the other hand, this will be the first time in our history that technology, which has played a key role in permitting the advancement of our civilization through time, could become an independent being itself as a consequence of the proliferation of Artificial Intelligence, a development that could as much help us overcome the crossroads and venture into a

new era, as much as it could cause our obsolescence and extinction.

As previously explained, whether we manage to overcome the next crossroads or not won't be determined by a specific choice made in a concrete moment, but rather by the culmination of all the choices we make in the coming decades in regard to all the constituents of the crossroads. Through the next decades these decisions will define what paths are opened to us and which ones are closed, a number that will progressively shrink the more we focus on a given path until our final decision is formed and the consequences of our actions are unleashed. While there are probably as many possible paths to follow as there are choices we could make in regard to the crossroads, there are only a few of them that make any sense at all, one way or another.

Ultimately I argue that most of the choices we could make in regard to the crossroads would converge into three clearly differentiated paths, the **Humanist** path, the **Transhumanist** path, and the **Singularist** path, the relationship we end up developing with technology through the next decades being what ultimately determines which one of those paths is taken. However, I pose that those three paths will not necessarily be mutually exclusive, as their level of compatibility and positiveness towards the whole of the human species will in large part be defined by their level of reasonableness in regards to our nature, limits, and strengths.

The end of civilization: Failing to overcome the crossroads

- First and foremost, we have to account for the possibility that, despite all our efforts, we might not be able to overcome *The Machine at the Crossroads*. If a single of the challenges the crossroads poses goes unresolved, our species would

more than likely face its decay and extinction, one way or another.

- Failing to recognize the dangers posed by **Black and White Swans** could end up disrupting the whole of our civilization at the worst possible time.

- Failing to solve every single one of **The many Debts we have Accumulated as a Species** through our history before they reach a critical point would either cause our regress to a less developed civilization state at best, or our complete destruction at worst.

- Failing to prevent the emergence of dangerous **Natural Events and Disasters** could prove to be enough to send us back to the stone age, or even make us extinct.

- Falling to utilize the **New Emerging Technologies** in a sensible way would likely lead to a *technological overload* that could disrupt our entire civilization, unleashing chaos into the world. Ultimately, a senseless abuse of these technologies could potentially lead to our species becoming either largely obsolete or completely unrecognizable, thus ending us in one way or another.

- The potential emergence of a **Technological Singularity** would prove to be fatal for our species if we failed to develop the ways to sensibly communicate with the beings such an event would create.

- As long as a single of these challenges remains unresolved, the crossroads might prove to be unsolvable, ending our civilization as a consequence.

- This is the most down-to-the-ground approach we could take in regards to approaching *The Machine At the Crossroads*, but it is also the most limiting one: following the *Humanist Path* would entail focusing on overcoming the crossroads in a way that would preserve the human being as it is today, thus heavily restricting the use of emerging technologies that could potentially alter or endanger our nature or the nature of society to extreme degrees.

- In this scenario we would try to prevent the most significant challenges the crossroads could pose, those being the technological overload, the technological singularity, and the extreme widening of human inequality as a consequence of the proliferation of body augmentation and modification technologies, from becoming a reality, as the emergence of those challenges would force us to enhance our nature at the risk of becoming obsolete.

- Most notably, this path would require heavily restricting the development and utilization of most emerging technologies, but especially of advanced Artificial Intelligence, Cybernetics, and Genetic Engineering. As a consequence, the most significant advancements those technologies could bring forth would be forfeited, while the necessity to curtain their development and utilization would force us to create extreme surveillance systems.

- Whether we would be able to overcome the other challenges posed by the crossroads without the help of those technologies or not remains a worrying question though, and even if we succeed in overcoming them there is no guarantee that we will be able to

curtain the development of advanced emerging technologies indefinitely. History has demonstrated time and time again that it is not really feasible to control, much less restrict, technological advancement, because as long as a single affected party is willing to utilize them no matter the cost, the rest of the world is forced to follow suit at the risk of becoming irrelevant.

- Besides, we also have to account for the sensibility factor. I argue that only a culturally, academically, socially, and politically sensible humanity, understood as a humanity that recognizes its nature, limits strengths and responsibilities in a sensible way, would be able to follow this path in a successful way, as only such a humanity would be able to both resist the temptation of senselessly embracing the use of the most advanced emerging technologies while also being able to overcome the challenges the crossroads will pose without their help, especially those related to the debts that we have accumulated as a species.

- In the end, however, I argue that, because of the nature of technology, the humanist path, even if sensibly followed, would not as much solve the crossroads in its entirety as much as it would just delay its most extreme challenges. While this delay could be significant, eventually we would be forced to face those challenges, thus making us take another path to follow. Ultimately, if embraced in isolation, this path would only amount to a temporary extension of the world as it is today, a development that could as much help us solve the crossroads at a slower pace, as it could make us unable to solve it in time,

depending on how sensibly we shape our cultural, academic and socio-political structures for now on.

One with The Machine: The Trans-Humanist Path

- Most of those who have studied the evolutive paths that technology might follow from now on seem to agree that there is very little that we can do to keep the most advanced forms of the new emerging technologies from being unleashed. While some of the most extreme consequences of this, such as the Technological Singularity, are largely theoretical, it is largely believed that one way or another, technology will eventually become so complex that we will be unable to understand it, and much less control it, anymore. Consequently, many argue that the only path we could follow in order to survive the continued evolution of technology is to become one with it.

- As defined by *Vernor Vinge* in his studies about the *Technological Singularity* (Vinge, 1993) this is what is known as the Trans-Humanist path, and it would entail the enhancement of the human being through technological means, especially in what concerns its body structure and intelligence, so that we could become comparatively as enduring and intelligent as artificial super-intelligences. As our intelligence level and fiscal resilience would become linked to the evolution of technology itself, we would become theoretically capable of overcoming the singularity, ultimately becoming Post-Human beings.

- However, following this path would require us irreversibly abandoning our nature, and adopting a

new more complex nature that might be completely alien to us. This is not necessarily something negative, but it is a path that I believe not everyone would like to follow. Arguably, the less complex aspects of trans-humanism, such as the development of clinical immortality and the hybridization of the human mind and body with mechanical and information systems are compatible with our nature as they can be understood as the natural extensions of technologies we currently utilize, but the more complex aspects of trans-humanism and especially intelligence augmentation and Human-AGI hybridization would pose such an extreme departure from our nature that most contemporary individuals would likely refuse to embrace their use.

- Vinge hypothesized that because of that apprehension to embrace trans-humanism fully, only a few humans would complete their transformation into post-humans, with the rest remaining in a trans-human state forever, with the post-humans serving as intermediaries between the trans-humans and the super-intelligences (Vinge, 1993). However, despite their human origin and because of their alien nature, we can not really know if post-humans would fulfill that role in a sensible way, or at all.

- Even then, there is no guarantee that we would take this path in a way that would give all humans a chance to become trans-human. If we consider the debts of our species in regards to inequality, we can theorize that an unreasonable humanity would fail to offer everyone that chance, thus causing the obsolescence and progressive extinction of a very significant part of the contemporary human population.

- Ultimately, it can be argued that the trans-humanist path woulda allow our species to continue its existence past the crossroads, and even past a potential technological singularity, in some form, but the resulting beings would be so different from contemporary human beings that humanity as we know it would no longer exist, for better or worse.

The age of the Machine: The Singularist Path

- What would happen if, in our attempts to overcome the crossroads, we ultimately failed to maintain control of technology? What would happen if, despite our efforts to enhance our bodies and minds as a way to avoid becoming irrelevant in the face of the emergence of synthetic minds more advanced than us, those minds become too complex for us to interact with sensibly? What would happen if a technological singularity finally occurred without us being prepared for it?

- The truth is that we can not exactly know what would happen in such a scenario, although we can at least theorize that, even if a technological singularity was never to occur, some of the new emerging technologies could end up evolving enough by themselves to become independent entities complex and alien enough to make us irrelevant. Losing control of advanced forms of Artificial Intelligence alone could prove to be enough to cause this.

- For the most part, it can be said *The Singularist Path* is not a path that we would choose, but one that we would be forced into. This scenario would come to be if we choose to embrace the use of the new

emerging technologies in a senseless way that
ultimately makes those technologies escape from our
control, thus making us obsolete and causing our
extinction or extreme unpredictable transformation as
a species.

- In theory, this path could unleash complex and fully
independent synthetic minds into the world, minds
that would be various orders of magnitude more
intelligent than us, minds that would be completely
alien in nature and intentions. We can only speculate
how those minds would perceive our species and
interact with us, but it would be unwise to think
that our existence would continue unaltered in their
presence. Even if these minds would not evolve enough
to become fully sapient, their complex nature and
affinity with technology and computing systems would
likely prove to be enough to completely transform the
world into an alien landscape not compatible with
human life.

- The ultimate consequence of following this path would
likely see those intelligences inheriting the Earth
and the legacy of our civilization, which would
permit them to overcome the crossroads at our
expense.

The Singularist Path

Completely entrusting our future to technology, at risk of technology making us obsolete in the process.

The Humanist Path

Favoring our humanity over technology, at risk of technology overwhelming us.

The Trans-Humanist Path

Attempting to merge our nature with that of technology, at risk of completely losing our humanity.
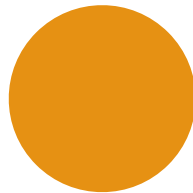
The Crossroads
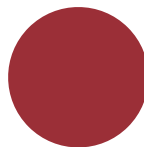
Failing to overcome the crossroads

Failing to overcome the crossroads, which could cause the extinction of our species.

The original paths of the crossroads, diagram

In conclusion, just like Vernor Vinge previously defined it through his studies about the *Technological Singularity* (Vinge, 1993), this analysis reveals that the only known path that could theoretically account for the potential occurrence of a technological singularity sensibly is the *Trans-Humanist* path, as the *Humanist* path by its own could prove to be insufficient when it comes to solving the more extreme challenges of the crossroads. Theoretically, if a technological singularity was never to happen, following the Humanist path would allow us to preserve the current state and nature of our species for the foreseeable future, at the expense of forfeiting the most significant benefits that the new emerging technologies could offer.

However, doing so would arguably only delay the inevitable, as technological progress would eventually force its way into the world, thus making us take the trans-humanist path at the risk of becoming overwhelmed or obsolete otherwise, even if a singularity never came to happen. Besides, because of the nature of the debts we have accumulated as a species, we might have no choice but to fully embrace the use of the new emerging technologies anyway, thus railroading us into the trans-humanist path even more.

As it stands, this path could be our only option to overcome the crossroads in a way that would allow us to preserve a part of our humanity, which is very disturbing, if slightly comforting, though. There are many ways through which trans humanity could come to be, some of them being more sensitive than others, but it would be unwise to believe, given the current state of the world, that we would be able to achieve the former instead of the latter. I argue that what shape trans-humanity ends up taking, in the end, will in large part be determined by our handling of the crossroads and that only by

trying to overcome the latter in a sensible way would we be able to develop the former in a more humane way.

Nevertheless, and despite the conclusions this analysis provides, there is yet another subject related to the crossroads that we should discuss, a potential development that, while not being a part of the crossroads in itself, its occurrence could heavily affect it, for better or worse, and would likely offer a forth path for us to follow, a path I argue could allow us to resolve the crossroads without forcing us to abandon our humanity. This subject is **the potential occurrence of an evolutive emergent behavior** as a consequence of human-caused organizational complexity and interactivity reaching a critical mass at a critical point, a process that could theoretically give birth to an emergent conscious mind more complex than us whose way of being would largely be determined In an indirect way by every human and human created system.

7.1.6 The Mind of Civilization: *An Evolutive Emergence*

I define **The human evolutive emergent** as the potential entity that could come to be from the occurrence of an evolutive emergence as a consequence of human interactivity and organizational complexity reaching a critical mass and said mass being stimulated by a significant environmental change that forces the subjacent system to adapt. This event would theoretically give birth to a naturally born and cognitively more advanced emergent conscious mind that would emerge from, but would not directly control, the entirety of the human population and human-created organizational, computational, and information systems. This mind would instead develop a symbiotic relationship with humanity, stabilizing and synergizing human organizational, technological, and information structures due to its emergent nature, while never directly interfering with the minds of the individuals that are a part of it.

This mind would be to the human civilization what the human mind and consciousness are to the human body: an emergent mind that is way more complex than the sum of its parts, and that manages to synergistically stabilize its subjacent system in a way that allows its constituents to remain independent. Much like ourselves as individuals can not control each individual cell or organ of our body, for the most part, this mind would

not control the individuals and systems that form it, but would rather indirectly help its constituents organize in a sensible way that guarantees the long term survival of the whole system. As humanity's way of being would determine this mind's personality, it would always have an unbiased and fair outlook towards our species and civilization, for better or worse.

Most notably, though, a human evolutive emergent mind would be various orders of magnitude more cognitively capable than any human being or simpler human group, and thus would be able to accomplish things that would otherwise escape our own intelligence level and imagination. Such a mind would also be capable of interacting with other super-intelligences, such as artificial super-intelligences or post-human beings, thus also fulfilling an intermediary role between those entities and the human civilization, theoretically permitting the continued existence of humanity past a potential technological singularity.

In regards to *The Machine At the Crossroads*, *the human evolutive emergent* can be understood as the embodiment of our civilization as a whole up to the point of the crossroad's occurrence, which would include all the individuals that compose our civilization at that point, alongside our accumulated knowledge and wisdom, our culture and art, our technologies, and our relation with the environment. In essence, if it was to emerge, this entity would represent the human species, as well as the human-created sapient synthetic beings, in the crossroads, our actions thoughts, creations, failures, achievements, and dreams being what determines its behavior, while the choices it makes would be the ones that determine the future of our civilization. Nevertheless, even if such an emergence never came to be, I argue that the conceptualization of this entity could help us understand and contextualize the nature of our civilization and its relation to the crossroads,

information that could prove to be invaluable for the successful resolution of the latter.

I argue If such a mind was to emerge, its eventual fate, and by its extension, that of our civilization, would likely be determined by our ability to overcome the crossroads, as we would become symbiotically tangled with it. However, I also argue that, as long as a sizable part of our species decided not to augment their cognitive capacities, such a mind would likely allow us to preserve our individual human nature even against the emergence of synthetic or post-human superintelligences, as it would serve as an intermediary between those intelligences and our civilization.

I base this theory on the many studies that have been conducted on the subject of the evolution of life, intelligence and consciousness understood as a succession of increasingly more complex emergent behaviors, giving special attention to the study conducted by *Todd E. Feinberg* and *Jon Mallatt, J.* titled *Phenomenal Consciousness and Emergence: Eliminating the Explanatory Gap* (Feinberg and Mallatt, 2020), and the study conducted by Scott Jordan and Marcello Ghin titled *(Proto-) Consciousness as a Contextually Emergent Property of Self-Sustaining Systems* (Jordan and Ghin, 2006, p.n).

As these studies pose, the entities that define each evolutive level tend to organize themselves to better survive the environment. In the lower levels of the evolutive scale, this organization is caused almost exclusively by the influence of the environment and the interactions caused between inanimate entities by the natural laws of the universe, while organization in the latter stages of evolution is caused by the reactions and interactions of living systems and organisms. When similar or compatible entities within a given evolutive level organize themselves, they do so up to a critical organizational complexity mass set by the limits of their own nature and the

conditions given by the environment. When a system reaches such a state, if a sufficiently disrupting environmental event happens that forces the system to adapt against an unprecedented situation, the system is either unable to adapt and dissolves, or provokes an evolutive emergent behavior to occur that stabilizes the whole system and manages to solve the environmental challenge.

This new emergent entity stabilizes the subjacent system in an indirect way, and starts to act as an independent and cognitively more complex being that is capable of doing things that its constituents were not capable of even when organized to their maximum capacity, while also serving as an intermediary with the entities that define the next evolutive level. As this new entity starts to interact with beings as complex as it, the process of organization and emergence starts once more, with the difference that, with each evolutive leap, the time necessary to trigger the next evolutive emergent is significantly shortened.

In general terms, the entirety of the evolutionary process, from the basic form of matter, to the birth and evolution of life, to the appearance of intelligence and, perhaps, the emergence of consciousness (this last part is not empirically verifiable because of the subjective nature of consciousness), can be understood as a part of this process: an accelerating succession of increasingly more complex and adaptable organizational systems that give birth to increasingly more complex independent beings through an emergent process.

When understood from this perspective, each key evolutionary milestone has defined itself as an emergent behavior of some kind, and, arguably, it would be logical to expect that further evolutionary leaps would occur in a similar way. In this context, it would also be logical to expect that an evolutive emergent could be born from human organization, interaction, and adaptation if those aspects of our civilization reach the

critical mass and adaptational crisis necessary to trigger the
event, a situation that *The Machine At the Crossroads* would be
perfectly suited to provoke.

- As explained, there are three main conditions that
  have to be fulfilled for an evolutive emergent to
  occur from any given organizational system.

- **First**, the system in question has to reach its
  natural limit in regard to its organizational
  complexity and environmental interactivity. In
  regards to humanity, *The Machine At the Crossroads*
  could potentially represent that moment, most notably
  because it could define a moment in which the natural
  organizational capacity of our species would no longe
  be able to process the information generated by the
  technologies we utilize to grow beyond our natural
  organizational, interactive and adaptational limits.

- Trans-humanism and ASI development would allow us to
  evolve past that point by either altering our nature
  or by forfeiting our own future in favor of creating
  cognitively more complex synthetic offspring that
  would inherit the fruits of the human civilization,
  but neither of those paths would allow the continued
  existence of humanity in a recognizable way.

- **Second**, once the system has reached its maximum
  natural organizational capacity, it has to remain
  stable long enough for the evolutive emergent to
  occur, a situation that would also be caused by *The
  Machine At the Crossroads*, as it would force humanity
  to remain stable after reaching said limit at the
  risk of dissolving otherwise.

- **Third**, a significant environmental challenge has to force the system to adapt in an unprecedentedly extreme way, triggering the occurrence of the evolutive emergent as a natural consequence of said process. The most critical challenges posed by *The Machine At the Crossroads* would cause such an adaptational event one way or another, thus triggering a human-caused evolutive emergent to occur.

- Therefore I pose that *The Machine At the Crossroads* would contain all the aspects necessary to trigger a human evolutive emergent behavior that would be formed from human-related organizational structures and interactions, which would include both the actions and interactions made by humans and human groups and those made by the technological systems we have created.
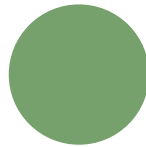
Prolonged Stability

The nature of the crossroads would force these characteristics to exist for a prolonged time, which would increase the chances of the emergence occurring.
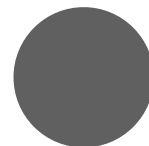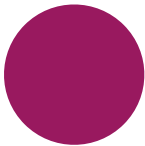
Environmental Challenges

The challenges posed by the crossroads would impose a demand for adaptation that could trigger an evolutionary emergent behavior.

The

The Evolutive Emergence

The sum of these characteristics could theoretically cause an evolutionary emergence mind to form as a consequence of human interaction.

Critical System Complexity

Human organizational complexity reaching a critical system mass, defined by our inability to specialize society further in the face of technological evolution.

evolutive emergence, diagram

Now well, it would be too preposterous to pose that such an event would unequivocally come to happen at some point in the foreseeable future, or at all, independently of the nature of evolution and the crossroads, but I argue that, given the existing research that has been conducted on the topic of evolutive emergence, summed to the defined structure of *The Machine At the Crossroads*, it would be prudent to at least consider it in a similar way to how we consider the potential occurrence of a technological singularity: an event that doesn't have to happen at all, but that we understand enough to know what circumstance could provoke it. Nevertheless, this would be an extremely intriguing development if it were to occur and opens up a completely new dimension to the crossroads.

By their nature, positive evolutive emergents tend to stabilize their subjacent systems in an indirect way by reorganizing their organizational structure without directly interfering with their constituents. If such an emergent is ever born from the human civilization in a positive way, we could expect that it would guide our civilization indirectly in a similar way to how our mind can control and guide our body without directly controlling its more elemental constituents. As such a mind would be defined by humanity as a whole, its behavior and personality towards us would be unequivocally unbiased, thus potentially solving the many organizational limits posed by our nature. However, this also means that, if such a mind was to emerge from humanity that has not managed to face the crossroads and organize itself in a truly sensible way, we could expect that it would erratic, or even self-destructing to both itself and our civilization, much as a desperate or insane individual can end its own life and body in multiple ways.

Unequivocally, however, a positive evolutive human emergent mind would be beneficial to our civilization, as it would not only stabilize our civilization in an unprecedentedly efficient,

dynamic, and unbiased manner but would also stabilize our relationship with technology in a sensible way, consequently letting us overcome the crossroads and venture into the future without having to renounce to our nature. More significantly, a mind of this type would be various orders of magnitude more intelligent than any AGI or human being, and any discovery made by it with their level of intelligence would directly benefit us similarly to how human research has allowed the human body to become better and more advance over time.

Very significantly, I argue that this type of emergent mind would help us develop a completely synergic relationship with technology without forcing us to fuse with technology on itself, as both human beings and synthetic beings such as AGIs would be constituents of the emergent. Similarly, this mind would also help us develop a synergic relationship between our civilization and the planet as a whole, because it would also indirectly emerge from the latter, and would recognize the importance of preserving the environment that caused its emergence in the first place. Therefore, after the emergence of a positive evolutive emergent mind, our civilization would consequently be redefined as one composed of both human and synthetic sapient beings that would have synergic relationships between themselves and towards the environment. An emergent mind of this type would also serve as an intermediary between our civilization and any other super-intelligence we might create or encounter, thus permitting our coexistence with post-singularity entities and the technological singularity on itself.

Ultimately, I argue that this scenario presents us with a potential fourth path to follow in regards to in what concerns the Machine a the Crossroads, the **Emergentist Path.**

A mind from all: The Emergentist Path

- What would happen if an evolutive human emergence was to occur in the latter years of *The Machine At the Crossroads*?

- I pose that, by understanding the nature of evolutive emergents and that of our own species and technology, we could reorganize our civilization from the ground up in a sensible way that would make way more likely that, if an evolutive human emergent was to occur, such an emergent mind would be a beneficial one instead of a self-destructive one.

- I argue that such an emergent mind would help us overcome the crossroads without having to abandon our humanity in the process, as such a mind would stabilize and guide our civilization in a sensible and indirect way that would have the best interest of our species at the hearth, while also being doted of a more advanced intellect that would be capable of sensibly utilizing the most advanced applications of the new emerging technologies. Consequently, I define the Emergentist Path as an evolution of the Humanist Path.

- Such a mind would help us develop a synergic relationship with technology and the environment, thus permitting the sensible incorporation of synthetically created sapient beings into our civilization, while also helping us restore and preserve the Earth in a responsible manner that would not be detrimental to us.

- A positive human emergent mind could also permit all the significant paths the crossroads would pose to coexist with each other, as it could serve as an

intermediary between humanity, post-humanity, and
Super Artificial Intelligences.

- In general terms, following this path would entail
  the redefinition of our cultural, academic, and
  organizational structures so that they tune
  themselves with our nature, the nature of technology,
  and the nature of evolutive emergents, a very complex
  interdisciplinary process different but comparable to
  what trans-humanity would entail.

- Even if an evolutive human emergent was not to occur,
  I argue that following this path would have a net
  positive effect on the health and capabilities of our
  civilization, as well as the wellbeing of each
  individual, as it would help us reconcile ourselves
  with our human nature, while also helping us utilize
  technology in a more sensible way, consequently
  helping us in our resolution of the crossroads, one
  way or another.

The Singularist Path

The emergent mind would serve as an intermediary between humanity and Artificial Super Intelligences, allowing us to coexist.

The Emergentist Path

Pursuing a human evolutionary emergence that could indirectly reconcile our nature with the nature of technology. The resultant emergent mind would stabilize our civilization and allow our species to coexist with super-intelligences.

The Trans-Humanist Path

The emergent mind would serve as an intermediary between humanity and post-humanity, allowing us to coexist.
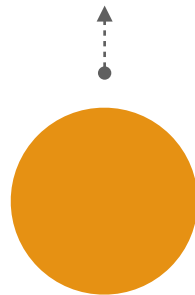
The Crossroads

The emergentist path, diagram

In conclusion, this path can be considered the evolution of the humanist path, and arguably presents itself as the only one capable of permitting the coexistence of all the paths posed by *The Machine at the Crossroads*. However, because of the hypothetical nature of a potential human evolutive emergence, the Trans-Humanist path remains the only one that, if sensibly executed, would assure the resolution of the crossroads in a way that would permit the continued existence of humanity. Nevertheless, as I have previously indicated, I argue that following this path would have very impactful beneficial consequences for our civilization even if a positive human evolutive emergence was not to occur, as following it would entail the sensible redefinition of our culture, academia, and organizational structures in relation to our nature, the nature of technology and the nature of our planet.

7.1.7 The machine at the Crossroads, Conclusions

What will the future hold for us? How will the World Of tomorrow unfold and change our lives? What will be of us if we fail to overcome the challenges that we will find up the road? What will we become if decide to merge ourselves with technology? What would be of our civilization if a synthetic super intelligence is born? Or if an emergent human mind comes to be? We really can not know, but we can at least imagine what the future might bring, which might be enough, as long as we act sensibly, to continue on with this, one way or another.

The Machine at the Crossroads serves as a way to contextualize what the future might bring, and thus fulfills the imagining part, yet it is evidently just a product of its time, a snapshot of the world of tomorrow as we can visualize it today. Only by conducting a constant reevaluation of how the future could unfold could we really create a more authentic representation of the crossroads, but even that would only be an act of imagination. The future is not something that can be predicted, it is something that is discovered and created, yet, as *Nassim Nicholas Taleb* points out through his studies about the Black Swans (Taleb, 2010), to not prepare for the future, or to do so in an insensible way, leaves you completely in the hands of chance, something that can make your journey come to an abrupt end if you are unlucky enough.

The Emergentist Path

The Crossroads

The Humanist Path

The Singularist Path

The Trans-Humanist Path

The Machine

The Parting Point

The Debts of our Species
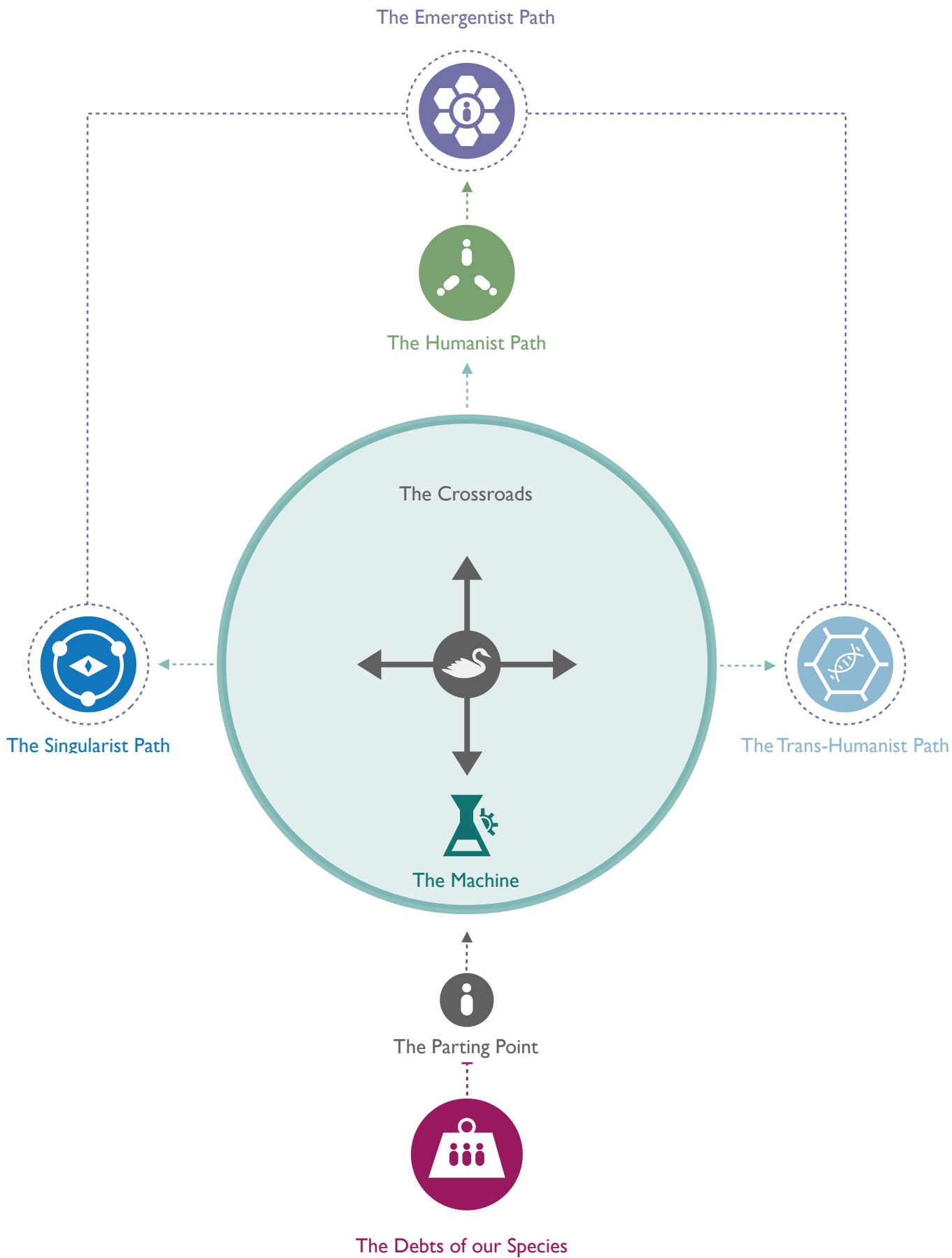
The Machine at the Crossroads, diagram

However, even if the crossroads that I have defined in this dissertation is just a snapshot of the future, I argue that the information and context it provides will be key in discovering and conceptualizing the ways through which we could overcome the challenges posed by the world of tomorrow in a sensible way, and especially in regards to the roles that art, culture, and academia could play in that context. As Bertrand Russell once said in his commentaries about Atheism,' *Not to be absolutely certain is, I think, one of the essential things in rationality*'(Russell, 1947). We can simply not be certain about anything, much less so about how the many things that will define the future might unfold, yet, if we imagine how they could do so, and we use that conceptualization to plan ahead in a sensible way, we will likely be more prepared to face the challenges ahead way more effectively than if we had done otherwise, because, even if these challenges do not unfold exactly as we have imagined, they will not catch us completely off guard.

I argue that, If we act sensibly as a civilization, we could detect and prevent the occurrence of White Swans before they materialize. I also argue that, If we develop our civilization in a sensible way that accounts for the eventual occurrence of unpredictable impactful events, we could prevent the more severe threats posed by detrimental Black Swans from ever becoming a reality. Lastly, I argue that If we develop a sensible approach to studying and conceptualizing how the future might unfold, we could use said knowledge as a guide to help us discover and create a better tomorrow for all. But what does acting sensibly entail in the first place? How could we become a sensible civilization? and what roles could art, culture, and academia play in that context?

To act *sensibly* means various things: for one, it means to act in accordance with reason and logic in a practical way, but it also means to act in accordance with our senses and our

perception of others and the environment. Therefore, to act sensibly means to act in a reasonable way while being fully aware of the environment around us and the consequences of our actions, both in regard to others and ourselves. Arguably, the contextualization of *The Machine At the Crossroads* has revealed that this is probably one of the best dispositions we could adopt in regard to the future both as individuals and as a civilization because most of the challenges it poses could be averted to a very significant degree if we faced them in a perceptive and reasonable way that managed to reconcile their nature with our nature and limitations.

However, it would be unreasonable to define what a sensible form of civilization would entail, for we are a civilization made of billions of individuals, and each of us has a different perception and interpretation of the world. However, it can be argued that there are certain characteristics, both positive and negative, that are universal to all human beings because they are set by nature, and are thus objective no matter our interpretation of the world. Consequently, I argue that, at the very least, we can use the framework set by nature as a guide to define how the crossroads could be tackled in a way that is reasonable for all of us on a fundamental level, independently of our personal and ideological differences. While said definition would by itself not be enough to construct a universal definition of what is sensible, it could help us lay the foundation from which a sensible redefinition of art, culture, and academia could be conducted in the context of the crossroads, which is the ultimate goal of this dissertation.

7.2 Argument II: Offspring of Nature
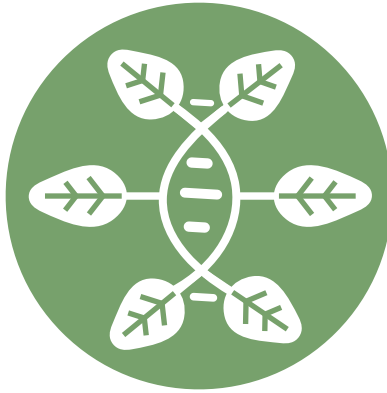
I argue that there are a series of universal characteristics and laws set by nature that are equally applied to every human being independently of their origin, way of being, or situation and that by extension of those individuals, these characteristics and rules are also applied to all human organizational structures, independently of their history, complexity, culture or ideology. I pose that these characteristics and laws, because of their universal nature, can help us define what can be considered a sensible human behavior on the most fundamental level. I argue that said definition can be utilized to both evaluate our readiness level as a civilization in the face of *The Machine At the Crossroads*, and as a way to help us conceive how art, culture, and academia could evolve into a more universally sensible form with the interest of overcoming said crossroads.

While there are many aspects that define these characteristics and laws, the ones that I consider the most significant for the research focus of this dissertation are those set by evolutionary theories and physical laws, chief among them **natural selection** and **evolution,** alongside **the laws**

of the universe on itself. Evidently, our understanding of the universe is not complex or complete enough to prove that these sets of laws are truly universal, as they have been defined from our own perception of the universe, yet I also argue that, at the very least, they can help us understand our own nature and limits enough to define a sensible approach to our actions within the context of those very natural aspects and limitations.

What research questions does this argument address?

- This argument is posed as a way to contextualize the natural aspects of the human being so we can better understand our relation to the crossroads, and thus addresses ***all my posed research questions***[3.5] in both direct and indirect ways, by providing a framework from which to understand the relation between our species and The Machine at the crossroads.

Natural Selection

The influence of Natural Selection on our species and civilization.

Environmental Conditions

The influence of the environment on our species and civilization.

The Tribal Mind

The capabilities and limitations imposed by our tribal mind.

Offspring of Nature

The set of universal natural aspects that define every human being. These aspects can be used to sensibly evaluate the readiness level of our species against the crossroads.

Offspring of Nature, outline

7.2.1 The Reign of Nature: *Natural Selection and the Human Being*
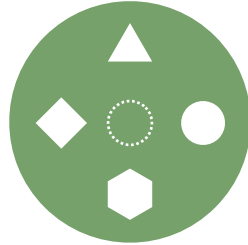
That we are defined by natural selection might come as a redundant and obvious assertion, but I consider that it is essential to expose it if we are to understand our natural characteristics: our species, just like all other species on the planet, was and is still defined by natural selection. Our technological and cultural advancements have allowed us to develop a more complex relationship with natural selection both in regard to ourselves and the species our actions affect, but those advancements do not free us from its grasp. The same rules that defined the evolution of our species are still applied to us, as history has demonstrated time and time again.

As natural selection dictates, a species has to adapt to the changing environment to survive and reproduce, and, generally speaking, only those specimens within a species with the characteristics more suited to survive an environment tend to survive on it long enough to pass on their genes to the next generation. Consequently, natural selection demands and creates diversity as a natural process of evolution that is defined both by the natural mutation of the species, more specifically by genetic drift and flow, and by environmental adaptation.

In general, terms, as explained by *Christine A. Andrews* in her studies, it is random genetic mutations and genetic drift that create enough diversity in a species to allow it to adapt to a specific environment through natural selection, with genetic flow allowing it to pass it to members of the same species that inhabit a different environment (Andrews, 2020). Then, natural selection causes only those that have the most desirable characteristics to survive in a specific environment to survive long enough to reproduce, thus making those genes more prevalent in the species while making the less desirable ones disappear, thus slowly transforming the species into one that is more suited to survive in that environment. This adaptational process as a whole is what is known as evolution, not only the final consequence of it.

Logically, natural selection implies that a species that is more diverse will be more likely to adapt to a new environment or challenge than one that is more homogeneous, as a wider genetic pool would increase the chances of some of those characteristics proving to be suited for the new environment or challenge, while a more narrow one could cause the species extinction if their predominant characteristics prove to be unfit for that new environment. As a result, environmental diversity causes genetic diversity, because each significantly differentiated area of the world leads to the emergence of a new subset of a given species, or to the emergence of an entirely new species, that is better suited to survive in that specific environment. In conclusion, we can say that **natural selection demands and generates diversity as a natural process of evolution**, and that this is a fact that applies to us as much as It applies to any other species.

Evidently, technology allows us to interact with natural selection in ways that no other species can, as we can not only use it to enhance our adaptational capabilities in the face of the changing environment but also lets us adapt the environment

itself to our needs. However, technology has its limits, and while we can say for certain that it allows us to grow independent from those aspects of environmental adaptation that we can perceive and control, that is not the case for those that escape from our perception, capabilities, and understanding. For example, if an antibiotic-resistant super-bacteria were to emerge tomorrow, it would be up to natural selection to allow us to overcome it as a species long enough for our technology to counter it. Consequently, it's reasonable to admit that we are still bound to natural selection, although in a different and more complex way than any other species on the planet. Reconciling ourselves with this fact is paramount if we are to overcome the crossroads, and thus has to be a defining characteristic of any sensible response to it.

7.2.2 A Diverse World: *Environmental Conditions and the Emergence of Human Civilization*

Natural selection does not only apply to the biological aspects of a species, but also to the cultural one. This is a relatively recent concept that Richard Dawkins first introduced in his book *The Selfish Gene* (Dawkins, 1976). Dawkins posed that, much like it is the case with species, cultures also had a transmissible aspect similar to genes that would allow them to be studied from an evolutive standpoint, which eventually lead him to define the concept of the *meme*: a meme (not to be confused with the *internet memes*, which appropriated the original name) is a basic idea or concept that is easy to transmit and serves as the building block for more complex ideas. Much like genes define the aspects of living organisms, memes do so for cultures, but unlike the former, which can only be transmitted through reproduction, memes can also be transmitted transversely from individual to individual.

Evidently, though, generational transmission and tradition do play a key role in determining the pace at which culture adapts to change and evolves over time, with the newer generations being more open to change than the older ones, yet even if this is the case, cultures can undergo significant

changes in decades instead of the many generations that takes organic species to evolve. However, this also means that cultures are extremely sensitive to environmental conditions and change, for better or worse, because the environment has a very significant role in defining the characteristics of a culture by making those who compose it develop and adopt ideas and concepts that help them survive said environment better, which causes cultures to evolve over time, or stagnate, depending on the conditions of the environment.

These original postulates made by Dawkins, which were seen with significant disdain from part of the broader scientific community at the time of their original publication, as most scientists pose that human behavior was too unpredictable to be analyzed from an evolutionary standpoint, eventually coalesced into the concept of *cultural selection*, a variation of the concept of natural selection (Dawkins, 1976). However, this field of study has not yet gained enough scientific background to be considered a scientific field on its own, as not enough significant studies have been conducted to prove or disprove it so far, but there are some studies that have, at the very least, proved that there is merit to the concept of cultural selection: a research group from the *Standford University* discovered clear similarities between the evolution of the indigenous cultures of Polynesia and natural selection caused biological evolution by analyzing the evolution of the canoes utilized by those cultures (Stanford, 2008). A year later, Zachary Yoscovits posed that an adapted form of algorithms based on those designed to study genetic material could be used to analyze the evolution of culture (Yoscovits, 2009).

Nevertheless, whether we classify this concept as cultural selection or an extension of natural selection doesn't change the fact that cultural evolution is defined by particular and environmental characteristics and changes as much as biological evolution, but in a different way. This is something that

becomes evident if we analyze the evolution of human cultures and technology through history, as contrasting them to each other allows us to define how ideological variation and natural environmental influence defined them. The books written by the bio-anthropologist *Jared Diamond*, *Guns, Germs, and Steel: The Fates of Human Societies* (Diamond, 1999) and *The World Until Yesterday: What Can We Learn from Traditional Societies?* (Diamond, 2013) explore this concept in depth, exposing the natural patterns that led to the unequal development of the world's different cultures and civilizations.

As diamond poses, the Homo sapiens originated in Africa roughly 300.000 years ago and started to migrate to the rest of the world 60.000 years ago. All contemporary human races are consequently the descendants of those original humans, and to a lesser degree of the other proximate primate species that those humans interbreed with. Diamond then explains that, barring aesthetic and secondary adaptational aspects, all human races have the same intelligence level and capabilities, and that the main factor that caused culture and technology to evolve unequal through the planet is entirely environmental in nature: **only those environments that permitted their inhabiting humans to develop agriculture and animal husbandry in a significant way allowed those societies to evolve past being nomadic hunter-gatherers.**

In practice, this meant that the Eurasian continent proved to be the perfect environment for the rise and spreading of civilization 10.000 years ago, as the region contained many cultivable plants and domesticable animal species, while the other continents did so only in a relatively limited way that did not let their inhabitants progress pass the Paleolithic age. Eurasia's horizontal structure also played a key role in spreading civilization through its entire extension, as said structure permitted the sharing of cultivable plants and domesticable animals thanks to the relative climatic homogeneity

it caused. The other continents weren't as lucky in regards to the availability and spread of those elements, which largely constrained their societies to the Paleolithic age.

In Eurasia, extensive farming and animal husbandry led to a population centralization from tribes of no more than 150-300 individuals to communities made by various thousands, which in turn led to the displacement or assimilation of the remaining nomadic hunter-gatherers. This caused a population explosion and provoked the specialization of the population as a response to the increasing amounts of information generated by society. Said specialization allowed for the emergence of the artistic and intellectual disciplines in a significant manner, which consequently, alongside the increased complexity of society itself, led to cultural and technological progress as a response to environmental, cultural, and diplomatic challenges, which led to further population explosions and further allowed for the assimilation of weaker cultures and languages by stronger ones. The increased population and technological level led to a further need for specialization and technology, starting the cycle anew, progressively causing the formation of the first large civilizations.
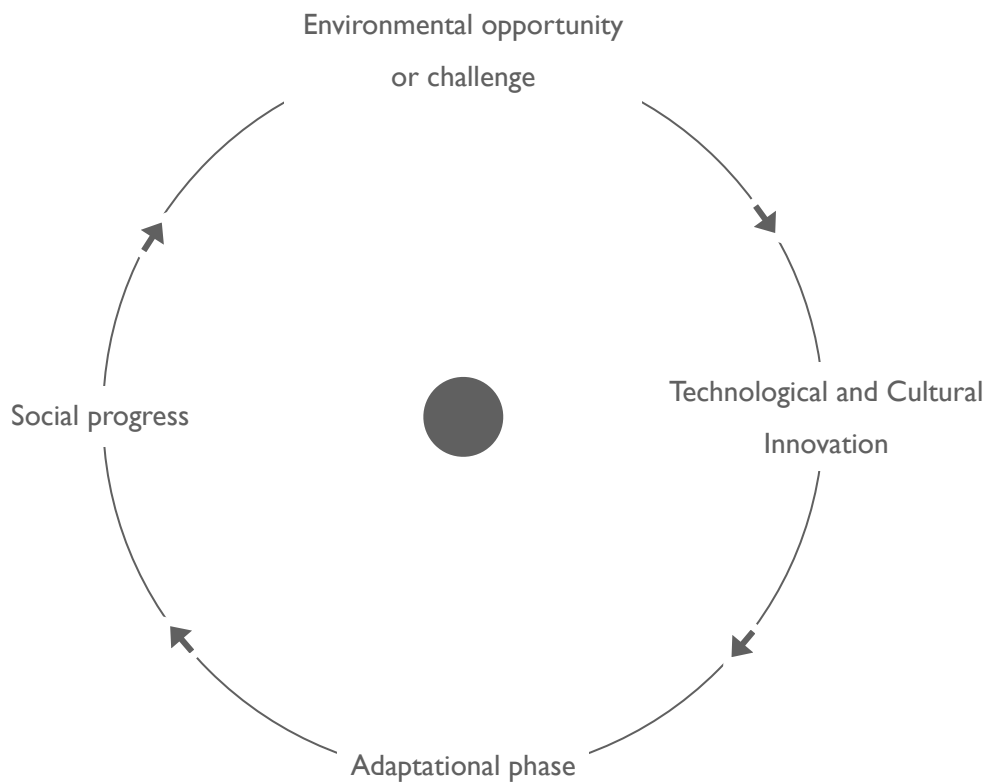
The evolution of civilization, diagram

While this process was heavily determined by cultural and environmental diversity, it was the presence of environmental and diplomatic challenges that forced civilizations to keep evolving further through time. In all those instances in which civilizations grew unchallenged, their development slowed down drastically. This is exemplified by the rising and eventual stagnation of the ancient Chinese empire: initially, ancient China evolved much like the rest of Eurasia, with farming and animal husbandry leading to the emergence of a plethora of different cultures and languages throughout the region, with the northern regions developing more than the rest thanks to more favorable environmental conditions. Unlike western Eurasia however, which was geographically more diverse and harder to navigate, mainland china was way easier to navigate thanks to the presence of the Yellow River in the north and the Yahtzee

river in the south, which allowed the northerners to easily propagate their culture and language through the entire region, a process that was further accelerated by their invention of writing and complex administration. Ultimately, this lead to the cultural homogenization of the region and the creation of the ancient Chinese empire roughly 2250 years ago.

However, the geographic similarities and ease of access that defined the areas that surrounded mainland china led to the expansion of the dominant Chinese culture into those areas, causing their cultural assimilation. In turn, this cause an extreme decrease in the environmental and diplomatic challenges that assailed the Chinese empire, which led to its stagnation, forcing it into a cultural and technological stasis that lasted until the arrival of European powers into the region. While this empire suffered many invasions and inner rebellions until the arrival of the Europeans, the cultural homogeneity that defined its core and surrounding territories meant that it managed to reform itself time and time again.

In contrast, the harder-to-navigate but even more diverse Mediterranean region allowed for the emergence of clearly differentiated civilizations that progressively developed a balanced relationship between cooperation and competition after seafaring became advanced enough to allow for the mediterranean sea to be utilized in full. While Alexander's conquests and the emergence of the Roman Empire is comparable to that of the Chinese empire, and would have likely led to a similar stagnation had the environment allowed it, the increased cultural diversity that defined the region made it impossible for the Roman Empire to maintain control of its territories for long, which, in conjunction with the pressure made by Northern and eastern barbarians, caused its fracturing, debilitation, and dissolution. While the eastern Roman Empire survived significantly more than its western counterpart, which can be attributed in grand part to its entrepreneurial nature, it only

did so in an increasingly weaker state which eventually caused its destruction.

Unlike the Chinese empire, Romans were not capable of fully imposing their culture into their conquered territories because of the significant environmental differences and transversal difficulties that defined Europe, the middle east, and northern Africa, but they did nevertheless have a very significant technological, cultural, and linguistic influence in those regions. This state prevented the western roman empire from reforming itself when it collapsed and caused the progressive evolution of many different complex civilizations throughout the entire Mediterranean region. Once again, the geographical and climatic differences between those areas, summed to the transversal difficulties that separated them, and the trading opportunities offered by the mediterranean sea, allowed those nations to develop both in competition and in cooperation with each other, forcing them into the renaissance and the modern age as a consequence.

Ultimately, what this analysis reveals is the key conditions that permit the evolution of advanced cultures and civilizations in relation to nature as a whole and to our own human nature, and remarks on the essential part that environmental conditions play in allowing or restricting cultural and technological progress, as they define the challenges and opportunities that shape cultures.

In general terms, we can determine that a given environment needs to provide enough natural or human-caused opportunities for societies to evolve, and enough challenges to force them to evolve by utilizing those opportunities in an inventive way. If not enough opportunities exist in a given environment, societies can not evolve at all and become bound to the nomadic hunter-gatherer or early tribal lifestyle, which was the case for most of the world aside from Eurasia as a consequence of cultivable

plants and domesticable animals not being very abundant in most continents. If not enough significant challenges exist in an environment, or the challenges diminish as a consequence of natural causes or cultural homogenization, societies only evolve up to when those challenges are no longer a threat to them and stagnate, which was the fate of the ancient Chinese empire. If not enough opportunities exist, but too many challenges are present, societies are displaced to another more favorable region or are otherwise destroyed or assimilated by another more advanced culture, which was the fate of those societies that faced extreme environmental changes unprepared, or that were discovered by societies that had progressed more.

This determines that for cultural, societal, and technological progress to happen successfully and for a significant amount of time, a given environment has to display a series of specifically balanced characteristics: first and foremost, it needs to contain **a balanced amount of natural opportunities and challenges** that allows societies to evolve from their base form to more advanced forms by their own means. This environment has to be **diverse enough to provoke the emergence of clearly differentiated cultures** through its extension, as said diversity is key to fostering innovation and permitting adaptability, but **it has to avoid being extremely diverse**, as an extreme amount of environmental diversity would prevent the advancements from one specific region from being useful through the entire area. Lastly, this environment **has to be traversable enough** to allow for intercultural cooperation and competition to occur in a significant way, as that generates further opportunities and challenges that force civilizations to keep evolving after they have mastered their immediate surroundings. However, this environment **has to avoid being too easily traversable**, because a territory that is too easy to transverse can lead to extreme cultural homogenization and technological stagnation.

All in all, this analysis allows us to comprehend why the most culturally and technologically advanced societies of our history emerged in the Eurasian continent, and especially around the mediterranean sea, as those regions fulfilled most of the requirements explained above. While the Mediterranean cultures where the ones to advance way more significantly in the end, had the central Asian region been more difficult to transverse the Chinese culture would have likely reached the modern age way earlier than them, with all that that implies.

However, there is yet another significant aspect of societal evolution that we have to discuss in order to fully understand this process: the sustainability factor. As *Brian F. Snyder* pointed out in his study titled *The genetic and cultural evolution of unsustanab*ility (Snyder, 2020), **societies tend to adopt increasingly less sustainable economic and productive practices after each technological leap in order to remain relevant**, as doing otherwise would render them vulnerable to competing civilizations, causing their downfall and/or assimilation. These practices are adopted with the goal of increasing both the productive output of a given society and the carrying capacity of the environment said society inhabits in a relatively short amount of time after a significant technological and cultural leap occurs, thus leading to a larger and more complex population that in turn causes further technological and cultural advancements that require further increases in production output and environmental carrying capacity.

Theoretically, the changes necessary to accommodate for each technological and cultural revolution, as well as for each consequent increase in the population size that is tied to them, could develop sustainably if the transformation process was given ample time to occur, as the environment would have enough time to adapt to those changes. However, in most cases, the pressure that competing civilizations generate on each other forces them to accelerate this process as much as possible,

heavily limiting the environment's capacity to adapt to those changes. This is an accelerating problem as a consequence of the accelerating nature of technological development itself, which implies that with each significant technological and societal leap we have increasingly limited the capacity of the environment to adapt to our progress, damaging it more with each passing century up to the critical point in which it is now.

Does this imply that it would be way more sensible if societies embraced technological and cultural innovation in a more sustainable way, even if that meant slowing the pace of progress? More than likely, yes, but the problem in this regard resides in the fact that the competitiveness that provokes unsustainability to occur is the same one that provokes technological and cultural innovation in the first place. As our history has revealed, if said competitiveness disappears, and no other significant environmental challenges remain relevant, civilizations stagnate, which is what happened to the ancient Chinese empire. Consequently, we can also argue that the Mediterranean environment failed to foster a perfect balance between the competitiveness and cooperativeness that defined the relationship of its resident civilizations, as it clearly fomented more competition than cooperation, leading to the continued proliferation of unsustainable practices.

I consider that finding that balance will be key to solving the crossroads, but I argue that we can not directly determine what characteristics an environment would require to foster cooperation and competition in such a way that would lead to constant sustainable development, because said environment has not occurred in human society so far. However, I also argue that there are other factors apart from the environmental ones that led to the proliferation of unsustainability through our civilization: those related to the limitations imposed by our tribal nature, a topic that is discussed in depth in the next chapter.

7.2.3 Of Campfires and Spears: *The Inescapable Legacy of the Tribal Mind*

This aspect of our nature is probably the one that conditions and limits us the most, but because of how it defines us it is very difficult for us to become aware of it in a significant way: as Dr.Cardoso explains, our body, but especially our mind, has not evolved in any meaningful way since our species started to develop and utilize culture and technology, with the last significant changes happening roughly 50.000 to 100.000 years ago. Consequently, our minds and bodies are still those of tribalistic nomadic hunter-gatherers. We can only sensibly perceive and remember what is contained within a tribal space: **a community of no more than 150 to 300 individuals, a physical area that extends, at most, to the horizon, and a time space calculated in seasons.**

While culture, hierarchical organization, and technology have allowed us to grow past those limitations as a society, they have not been able to change our nature, provoking an ever-increasing tension to rise between those aspects of our civilization.

Our species was forced to develop more complex forms of culture and organization to cope with the increased informational complexity that the technologies we developed and

utilized generated, but said development wasn't accompanied by the evolution of our own minds. **We simply reorganized society into a series of specialized strata and groups, with each of them becoming a tribe of their own**, but these groups never managed to grow past the limitations imposed by the tribal mind. If we consider that most complex human organizational structures have been, and still largely are, hierarchical and specialized, we can then determine that **societies become increasingly less sensible the more they have to specialize and stratify,** because those who occupy the higher echelons of these societies become increasingly less capable of perceiving reality, and thus of making sensible decisions.

Environmental Perception
Immediate surroundings, up to the horizon.

Social Perception
150-300 individuals.

Perception of Time
Seasonal.

The Tribal Mind

Everything outside the tribal space is perceived as abstract.
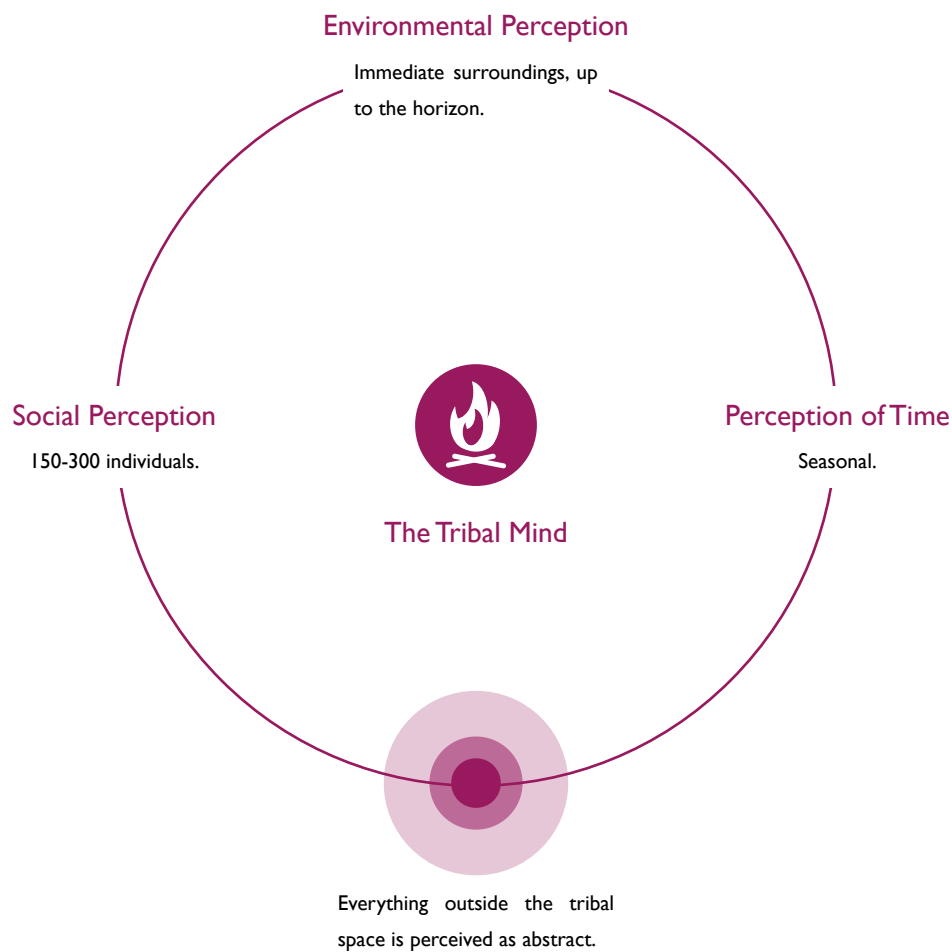
The tribal mind, diagram

Our history reveals that this is a very significant problem that is prevalent throughout the entire social structure and that it can go both ways in the hierarchical structure. It is evident that because of these limitations, and barring some exceptional circumstances, individuals will always perceive the world that exists beyond what is proximate to them as abstract, and that they will, when possible, delegate the perception, decision making, and responsibility that concerns elements that exist outside their tribal space to others. It is also evident that individuals will always be biased in their decision-making in favor of what is proximate to them and to the detriment of everything else, as they can only form deep emotional connections with those individuals and locations that they can fully perceive. Evidently, this problem becomes more significant the more power a person accumulates, as their authority is still bound to the same perceptive limitations as everyone else, and more often than not said dissonance leads them into making choices that are immediately beneficial to their tribal space, but that are short slighted and insensible in regards to everything outside of said space.

Perceptive dissonance also determines how individuals delegate decision-making and responsibility, as most persons prefer to avoid making decisions in regard to things they can not sensibly perceive, and ultimately almost always try to delegate the responsibility of their actions to others if said actions have had a perceptible detrimental effect on society, as doing so is beneficial to their tribal space at the expense of only what they perceive as abstract. As the experiments conducted by *Solomon Asch* and *Professor Milgram* exposed in the *Ash* and *Milgram* experiments (Lumen, 2021), individuals will always delegate their decision-making and responsibility to the group they are a part of or to a higher authority as long as they determine that they can not fully perceive what they are tasked to handle, independently of how sensible or insensible

the decisions made by those authorities are. Evidently, this problem is made worse by the structure of traditional education, as it encourages social conformity in favor of hierarchical compliance and at the expense of critical thinking, and has become increasingly more significant the more society has specialized.

Nevertheless, we have to recognize that, despite all the problems it causes, hierarchical and specialized social structures were key in allowing social progress past tribal organization, as not adopting them would have denied us the possibility of growing around our natural social and perceptive limitations, and more significantly, would have impeded us from being able to manage the increasing amounts of information generated by technological progress. However, as explained by *Buckminster Fuller* in his book *Operating Manual for Spaceship Earth* (Fuller, 1969), hierarchical and specialized social structures become increasingly less capable of adapting to technological progress the more they have to specialize as a consequence of constant technological progress, with each subsequent technological revolution causing an adaptational period more tumultuous than the previous one. As Buckminster posed, if society were not to evolve into a less specialized and hierarchical structure that managed to reconcile our own nature with that of technology, it would eventually become incapable of controlling the technology it depended on, leading to a technological overload and societal collapse (Fuller, 1969 p. 1-14).

Besides, as I posed <u>in conclusion to the last chapter</u>[7.1.7], It can be argued that **these perceptive dissonances are one of the main causes of unsustainable development** because our tribal mind can not really process, and much less empathize, with the long-term consequences of environmental degradation, but it can definitely perceive the short-term potential negative consequences that adopting a sustainable approach to progress

instead of an unsustainable one could have in regards to what it perceives as the tribal space. As long as the unsustainable route is perceived as the most beneficial for said tribal space in regards to the short-term future, every individual will choose it over the sustainable one no matter their position in society, disregarding the negative consequences following that route could have in the future because the individual won't be able to perceive those consequences as relevant to their tribal space in the first place.

This behavior could help explain why those time periods that have been defined by rapid technological progress have usually occurred alongside huge spikes of unsustainability and social upheaval, and why those environments that are geographically very diverse but that impose dynamic difficulties for their transversality, such as the Mediterranean area, facilitate the emergence and constant advancement of advanced civilizations: those who governed those civilizations were likely pressed to constantly foster social progress and technological innovation to out-compete their rivals, either militarily, culturally or commercially, with no regards to the unsustainability of the practices utilized, as they likely perceived that doing so was the only way to guarantee the short term well-being of their perceived tribal space.

As the Mediterranean area proved to be diverse enough to cause the emergence of many different cultures, but difficult to transverse enough to keep them from fully assimilating or destroying each other, **this created the perfect environment to foster widespread technological and social progress, at the cost of the proliferation of unsustainable development and social stratification.** Even if we account for Alexander's conquests and the emergence of the Roman Empire, the geographically and culturally diverse nature of this environment prevented large-scale civilizations to perdure for more than a handful of centuries, for they were unable to fully consolidate the culture

of their territories. Ultimately, these empires contributed very significantly to social and technological progress, but their eventual collapses, summed to their inability to reform, kept them from stagnating their territories.

Evidently, this process repeated itself and became more significant the more technology and society advanced, progressively giving shape to civilizations that were founded on unsustainability, senseless technological abuse, and excessive social stratification. Technological progress made those civilizations spread their influence through the entire world, but they have never been able to escape the legacy of their tribal origins. In fact, said technological progress has made the dissonance between our tribal and our perception of the world to increase, and the impacts of the actions of those who occupy positions of power increased dramatically, thus leaving us in a very precarious and volatile situation: **if we are not to reconcile our tribal nature with the nature of technology through the redefinition of our social and communicational structures, it is very likely that our civilization will be unable to sensibly overcome The Machine at the Crossroads.**

To recapitulate, let's incorporate these elements into a concise hypothesis:

Our Tribal Legacy

- Much evidence supports the theory that <u>the mind of the homo-sapiens stopped evolving roughly 100.000 years ago</u>[5.3.2.4].

- This implies that the homo-sapiens are still only capable of perceiving and interacting with the world on a tribal scale, with many sociological studies

proving this theory, chief among them the studies conducted by *Robin Dunbar* (Lumen, 2021).

- The development of technology allowed us to grow around those limitations and create complex civilizations, but the increasing amounts of information generated by technology and societal growth forced us to adopt stratified and hierarchical organizational structures to be able to administrate said information.

- As individual humans did not manage to overcome their tribal limitations, they developed a perceptive dissonance towards the rest of society because they could only perceive their tribal space.

- As society became stratified, and as those who occupied positions of power were still defined by those limitations, social inequality and unsustainable practices became common, for those in power were biased in favor of the short-term benefit of their perceived tribal space.

- This process became a constant in those regions of the world which allowed for constant technological and social advancement, progressively giving shape to increasingly more advanced, stratified unsustainable, and unequal societies (Fuller, 1969).

- If not corrected, this process could eventually lead to a societal collapse, as civilizations will likely become unable to sensible handle the information they generate (Fuller, 1969).

This analysis reveals that the perceptive dissonances imposed by our tribal mind, especially when they are accentuated by a hierarchical organization, could severely compromise our handling of the crossroads, while, as Buckminster explained, the increasing inability of hierarchical and specialized organizational structures to deal with technological progress could make us lose control of the technologies we depend on at the worst possible time. Thankfully, this analysis also provides us with the keys to how we could solve this problem: **we need to transform society into a less specialized and hierarchical system that is more tuned to the limits of our own minds and the nature of technology**, in other words, **we need to manage to reconcile our tribal nature with the nature of technology and civilization through a redefinition of society that is tuned to those natures.**

It is through my artistic, academic, and cultural postulates that I will explore how this process could be undertaken sensibly.

7.2.4 Offspring of Nature, Conclusions

●━━━●━━━●▍

We are the offspring of nature as much as any other living being on this planet, and while our cultural and technological advancements allow us to have a complex relationship with the universe, we are still bound by the natural laws that define it. This analysis reveals to us that we have not really overcome the natural limitations of our species as much as we have utilized technology and culture to go around them, but that in doing so we have set ourselves on an unsustainable path that confronts the limits of our own mind with the increasingly complex nature of technology, as our social structures can only specialize so much before they become incapable of managing themselves, and technology, in a way that would not lead to its collapse.

What does nature demand from us? What does it offer us? What can we do to reconcile ourselves with our own nature? What can we do to reconcile ourselves with nature as a whole? And to reconcile ourselves with technology?

Of Nature and technology

- Natural selection demands and generates diversity both in a biological and cultural sense. Therefore, it is sensible to not only accept but to foster diversity in regard to both human reproduction and culture.

- Natural, environmental and cultural selection determines that the environments that human societies inhabit have to strike a delicate balance between their diversity, homogeneity, and transversality to

allow human cultures and technologies to evolve in a
continued way. It would be sensible to mimic these
patterns to define our cultural environments and
networks.

- Environments need to provide constant challenges to
  force societies to evolve, and opportunities to
  permit that evolution through cultural and
  technological innovation. Environments need to be
  transversal enough to permit the proliferation of
  technological and cultural evolution, but they have
  to avoid being too easy to transverse, as that can
  lead to cultural homogenization and stagnation once a
  civilization overcomes its most significant natural
  challenges.

- Environments need to be transversal in a way that
  permits cooperation and competition to occur between
  their residing societies in a balanced and dynamic
  way. Too much cooperation leads to stagnation if no
  other challenges remain. Too much competition leads
  to unsustainable practices becoming too prevalent,
  causing the exponential deterioration of the
  environment. A balanced dynamic sift between those
  aspects could lead to sustainable progress, but is
  not easy to determine what such a balance would
  entail.

- A given species has to avoid relying on unsustainable
  practices for too long, especially in an accelerating
  way, as said practices progressively damage the
  environment until it can no longer support its
  inhabiting population. Therefore, we can say that
  unsustainability is an insensible practice, while
  sustainability is the sensible one.

- Our biological evolution stopped 100.000 years ago. Consequently, our minds are still those of nomadic hunter-gatherers, which prevents us from sensibly interacting with anyone or anything that exists outside of <u>what we perceive as our tribal space</u>[7.2.3].

- Technology and hierarchical organization allow us to grow around these natural limitations, but they don't solve them because they do not directly expand the capabilities of our minds. Technology and culture allow us to expand the general capabilities of individuals and tribes, but not their perception of the world beyond the tribal space, which they still perceive as abstract. This creates an ever-increasing dissonance between human societies and the technologies and organizational structures they depend on, with said dissonance becoming more significant the more a society advances technologically, as said progress forces societies to hierarchize and specialize further in order to be able to manage the growing amounts of information technological progress generates. This development, if unsolved, would eventually cause a technological overload and social collapse.

- Similarly, our perceptive limitations provoke us to make biased decisions in favor of what we perceive as our tribal space, which, paired with our dependence on specialized hierarchical organization, provokes social inequality and unsustainable practices to become prevalent throughout society. If unsolved, this situation will eventually provoke an environmental and social collapse.

- Arguably, we have had no option but to adopt hierarchical and specialized organizational

structures to permit the advancement of civilization,
but the new emerging technologies, especially those
related to automation and artificial intelligence,
might allow us to develop a social model that is more
in tune with our tribal nature, as long as we learn
to use those technologies as a bridge between our
nature, technology as a whole, and culture in a way
that respects the characteristics and limitations of
each of them.

- We can argue that it would be sensible to recognize
the limitations of our own nature throughout the
entirety of our civilization. We can also say that it
would be sensible to reconcile that nature with the
nature of technology and culture by redefining social
structures in a way that is attuned to all those
elements and to nature as a whole, especially in
regards to its universal laws.

This chapter unveils that the most significant weakness of
our civilization emerge from the fact that we have not managed
to reconcile our own nature with the nature of natural evolution
and technology, and it offers us the key to solving this problem
by revealing how these three elements interact, unveiling what
is sensible to do and not in their regard. While this definition
is limited in scope, I argue that it is complete enough to allow
us to conduct a sensible redefinition of art, culture, and
academia that is in tune with our nature, the nature of
technology, and the nature of evolution, and that said
redefinition could potentially help us overcome *The Machine At
the Crossroads* in a way that is more impartial and beneficial to
the human species as a whole that it would be otherwise.

7.3 Argument III: A Short-Sighted Leviathan

Would contemporary humanity be capable of overcoming the challenges posed by *The Machine At the Crossroads*? If I'm sincere, I don't think that one can truly answer that question without making a value judgment, as our civilization is too complex for a single individual to make such an assessment objectively. Nonetheless, I think that it is necessary to, at the very least, evaluate how the most relevant characteristics of contemporary human society compare to the natural characteristics and limitations that define us in the context of the crossroads, as I consider that such a comparison will be necessary to articulate sensible artistic, cultural and academic postulates that could potentially help us overcome the challenges the future will bring.

In this chapter, I'll explore said relationship, exposing how contemporary political, economic, cultural, and academic structures compare to our nature as a species, our relation to nature as a whole, our relationship with technology, and the nature of the crossroads. Evidently, the sensitiveness of this topic demands that I refrain from utilizing concrete examples to illustrate my arguments when tackling political matters, and I

will therefore analyze those subjects only through generic representations.

What research questions does this argument address?

- This argument addresses ***my Contextual underlying research questions focused on the emerging technologies***[3.5.1], ***my Contextual underlying research questions focused on the emerging challenges of our time***[3.5.2], and my ***core contextual questions***[3.5.3], as they explore the nature of contemporary human civilization in the context of the crossroads.

Contemporary Power Structures

The state of contemporary human organizational structures.

Contemporary Economics

The state of contemporary economies and economic doctrines.

Contemporary Academia

The state of contemporary academic and educational institutions.

Contemporary Art

The state of contemporary artistic movements and institutions.

Contemporary Culture

The state of contemporary cultures and cultural institutions.

A Short Sighted Leviathan

The evaluation of the readiness level of contemporary human civilization against The Machine at the Crossroads.

A Short Sighted Leviathan, outline

7.3.1 An ape with a crown: *Contemporary Power Structures*
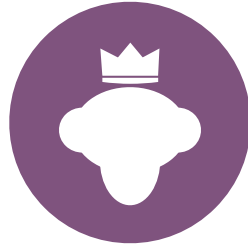
Practically all contemporary human organizational structures are the descendants of those that emerged in the advent of civilization roughly 10.000 years ago. While these structures are exceedingly more complex than their original counterparts, they share the same general characteristics, strengths, and weaknesses. Much like those primordial human societies, modern civilizations utilize technology, organizational specialization, and hierarchical power distribution as a way to grow around the limitations posed by our tribal nature, at the expense of creating a perceptive dissonance between the specific groups that compose society, which have a tendency to organize themselves as if they where separate tribes of no more than 300 individuals, and the rest of civilization. By analyzing our nature[7.2.3], we can conclude that this comes to pass because the individuals that form those groups are still limited by the primordial nature of their minds, which forces them to perceive everything that exists outside the scope of a tribal environment as an abstract entity, biasing their decision-making in favor of their tribal space.

On top of this, we also have to add the dissonance that our over-dependence on technology caused. Our species utilized technology to grow around our tribal limitations, but we never

managed to reconcile the ever-evolving nature of technology with the evolutionarily stagnant nature of our tribal mind. This, in turn, made us progressively less capable of administrating the increasing amounts of information that technology generated, which made us more dependent and more vulnerable to technological innovation after each significant technological leap. As I previously explained[7.1.2], this process could potentially lead to a technological overload if we don't manage to reconcile those two natures before their relationship reaches a critical point.

Therefore we can argue that all complex contemporary human organizational structures, no matter what discipline or culture they are a part of, share the following characteristics: **they are hierarchical, rely on specialization, and utilize technology as a way to maintain their organizational complexity.** Similarly, we can also argue that **all of them suffer from perceptive dissonance to a significant degree**, with said dissonance being more severe the more stratified and specialized a given society is, and that said dissonance biases their decision-making in favor of the short-term benefit of what those who occupy the higher echelons of the power structures perceive as their tribal space. Lastly, we can also say that **all of them are vulnerable to sudden technological progress as a consequence of their over-reliance on specialization and technology-based organization, and that said venerability is only going to increase as technology progress further, potentially leading to a Technological overload.**

As explored in the previous chapters of this section of the dissertation, we can come to this conclusion by contrasting the studies conducted by *Jared Diamond* in regard to the evolution of civilization (Diamond, 1999), with the analysis conducted by *Silvia Helena Cardoso* about the tribal nature of the human mind (Cardoso, 2001), and the studies conducted by *Buckminster Fuller*

in regards to the evolution of human organizational structures through specialization and the use of technology (Fuller, 1969).

Using those definitions as a framework, we can evaluate the readiness level of contemporary power groups against the crossroads, the most significant of those groups being **Representative Democratic Governments**, **Authoritarian Governments**, **Large Scale Corporations**, and **Billionaire Holdings**. As this topic is political in nature, I will refrain from making any direct references to real-life governments or organizations, as I consider that doing so would be insensitive. The literature that supports the arguments made in this chapter is explored in the literature review chapter dedicated to analyzing the emerging political challenges of our time[5.2.2.5].

Representative Democratic Governments and The Machine at the Crossroads

- While representative democracies have a significantly less stratified power distribution system when compared to other more authoritarian forms of government, they are still largely hierarchical and specialized in nature. Consequently, these types of governments suffer from severe perceptive dissonance, because the representative officials that compose them have a very disrupted perception of the reality and the individuals they administrate and govern, as a consequence of those entities existing only outside of what they perceive as their tribal space.

- To this factor, we have to add the elective nature of representative democracies, which biases politicians in favor of making decisions that benefit them and their party in the short term at the expense of long-term planning that could benefit the whole

population. Because of this, representative democracies are short-term focused and rarely take preemptive action against challenges and events that might hypothetically unfold in the future. This makes them extremely vulnerable to White Swans. To that factor, we have to add the very significant influence that the private sector tends to have over contemporary democratic governments, which further biases their decision-making in favor of those choices that are beneficial short term at the expense of the long term future.

- Although representative democracies are generally culturally more diverse than authoritarian regimes, the ideological polarization that usually defines their population, summed to the irresponsible and insular behavior means that they are also extremely inefficient when adapting to unforeseen or unplanned for events or crises. Consequently, they are also very vulnerable to Black Swans.

- In conclusion, we can argue that, aside from being limited by the same base elements as every other human organizational structure, representative democracies are very ill-suited to face the challenges the Machine at the Crossroads could pose as a consequence of their reactive and polarized nature.

Authoritarian Governments Governments and The Machine at the Crossroads

- Because authoritarian governments are considerably more centralized, stratified, and specialized in their organization than democratic ones, they suffer

significantly more from perceptive dissonance, with all that that implies.

- Because Authoritarian governments are not tied to an electoral system, they tend to feel less accountable for their actions. Consequently, these government types are more inclined to pursue long-term initiatives than representative democratic governments, for better or worse. This behavior, summed with the ideological and cultural unity that tends to define the nations governed by authoritarian regimes, means that generally speaking, these types of governments have a way higher success rate in preventing the occurrence of White Swans than their representative democratic counterparts.

- However, those same characteristics mean that both the officials that compose authoritarian governments and their citizens are constrained to follow a very narrow set of ideological and cultural tenets, at risk of being prosecuted otherwise. As a consequence, authoritarian governments are significantly more vulnerable to Black Swans than democratic governments because, on the one hand, their ideological narrowness blinds their perception of those events that would fall outside their mindset, while their cultural homogeneity and extreme centralization severely reduce their capacity to adapt to unforeseen or unplanned for events.

- We also have to consider that, as a consequence of their ideological narrowness, authoritarian governments tend to be comparatively way less sensible and ethical when it comes to developing and utilizing advanced forms of technologies than democratic governments, which severely increases

their chances of provoking the emergence of
detrimental Black Swans, especially those related to
the misuse of advances technologies.

- In conclusion, while authoritarian governments are
better suited to prevent the occurrence of White
Swans than their democratic counterparts, their
extreme weakness to Black Swans, summed with their
natural tendency to generate them, leaves them
similarly vulnerable against the machine at the
crossroads as a whole.

Large Corporations and The Machine at the Crossroads

- In general terms, large-scale corporations display a
level of power centralization, ideological
narrowness, and professional specialization
comparable to authoritarian regimes, while also being
as short-term accountable for their actions as
democratic governments as a consequence of their
subordination to their investors and to the market as
a whole. Consequently, it can be argued that large
corporations inherit the weakness of both democratic
and authoritarian governments, but none of their
strengths, and are very severely affected by
perceptive dissonance.

- Large-scale corporations tend to focus almost
exclusively on making choices that are immediately
beneficial to their high-level executives and
investors at the expense of sensible long-term
planning that could benefit the company and their
customers as a whole. Because most of these decisions
are made in accordance with the nature of the

contemporary free markets, large corporations are
extremely vulnerable to both White and Black Swans.

• While the influence that these types of corporations
tend to be way less direct and impactful than that of
governments, their increasing relevance in regard to
the development and large-scale implementation of
advanced technologies means that their power, and the
consequences of their actions, will only increase as
the century progresses.

• In conclusion, large-scale corporations will more
than likely play a key role in our resolution of the
crossroads, even if indirectly, which is a very
disconcerting thought if we consider that they are
very poorly suited to face the challenges the
crossroads will pose.

Democratic Governments

Reactive and polarized.
Vulnerable to White and
Black swans.

Large Corporations

Reactive and narrow-minded.
Extremely vulnerable to Black and
White Swans.

Billionaire Holdings

Extreme perceptive dissonance.
Extremely vulnerable to Black
and White Swans.

Authoritarian Governments

Proactive but narrow minded.
Extremely vulnerable to Black
Swans.
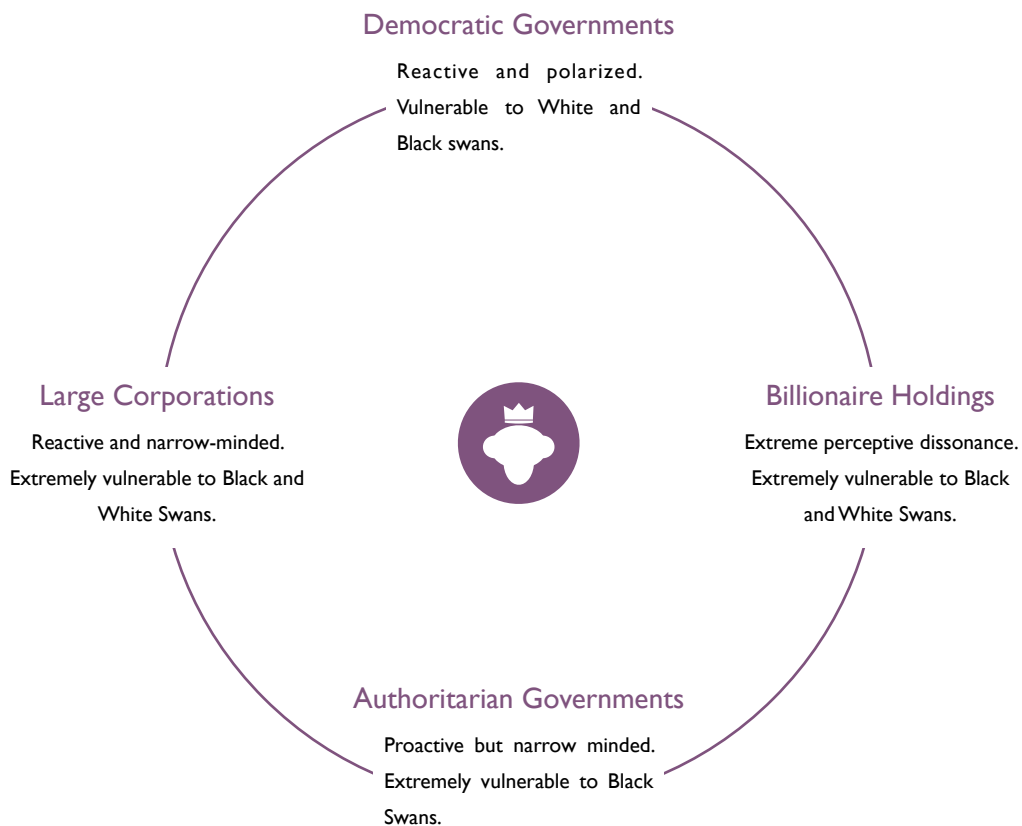
Contemporary power structures, diagram

Billionaire Holdings and The Machine at the Crossroads

- I argue that those individuals that accumulate
  extreme amounts of power and resources are, by far,
  the least appropriate to determine our handling of
  the crossroads, for, at the end of the day, they are
  just singular human beings that have managed to
  accumulate a power level comparable to that of entire
  nations. Consequently, the perceptive dissonance that
  defines their actions, and the negative consequences
  of said behavior, is second to none.

- Their personal ideas, dreams, fears, and proximate
  life could determine the actions of billions of
  individuals, yet their perception of the world is as
  limited as that of any other human being. If we then
  also consider that their behavior tends to be
  determined in large part by the nature of
  contemporary economics, we can conclude that they are
  extremely vulnerable to both White and Black Swans.

- As a result, we can argue that these individuals
  represent the logical conclusion to our flawed
  attempts at creating complex organizational
  structures that do not account for our tribal nature.
  Their decisions could condition the fate of our
  entire species when the crossroads unveils itself,
  yet they are, by far, the least appropriate to
  determine how such an event should be handed.

We can expect that, just as it has happened on similar
occasions throughout our history, as *Buckminster Fuller* explored
in his book *Operating Manual for Spaceship Earth* (Fuller, 1969,
p. 13), most of our contemporary organizational structures and
their existing hierarchies will attempt to solve the crossroads

in a way that permits their continued existence into the future, but I argue that they will more likely not succeed this time, for non of them have managed to reconcile our tribal nature with the nature of civilization and technology.

On the one hand, I argue that their perceptive dissonance will force them to make choices that will eventually cause the occurrence of extremely disruptive White and Black Swans, severely compromising our chances of successfully overcoming the challenges posed by the crossroads. On the other hand, I argue that, precisely because these organizational structures will come to the conclusion that they are incapable of administrating the increasing amounts of information the utilization of new emerging technologies will generate, they will attempt to utilize artificial intelligence and automation systems as an intermediary to maintain their structure stable, as those systems will be able to handle that amount of information, which would be a sensible choice if not for the fact that, because of its artificial nature, those Ai systems would likely be as biased as those who created and utilized them. This would undoubtedly lead to the occurrence of more detrimental White and Black Swans, and would also increase the chances of a technological overload occurring.

In conclusion, we can determine that non of our contemporary human organizational structures are prepared to face *The Machine At the Crossroads*. All in all, I argue that if we don't manage to reconcile our tribal nature with the nature of technology and evolution, we will likely have no real chances of overcoming the crossroads in a way that would permit our species to maintain its identity, which would as implied by the studies conducted by *Jared Diamond* (Diamond, 1999) and *Buckminster Fuller* (Fuller, 1969) require our species to widely adopt a less centralized and more responsible political system sensible enough to understand our natural limitations and to act in accordance to those

limitations within the framework offered by the machine the crossroads.

In general terms, I argue that a liquid democratic system would likely manage to fulfill those requirements, yet I also argue that for such a political system to work properly it would require a sensible cultural, artistic and academic foundation to sustain it, as its constituents would act insensibly otherwise. This is a topic that will be explored further in the chapter dedicated to my artistic, cultural, and academic postulates.

7.3.2 A tower built upside down: *Contemporary Economics*
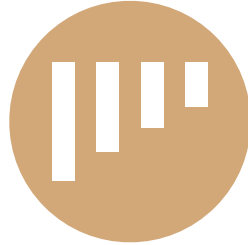
Much like our contemporary organizational structures, the dominant economic systems of our time are a legacy passed onto us generation after generation since the neolithic revolution. This is exemplified by the studies conducted by *Jared Diamond* (Diamond, 1999) and *Brian F. Snyder* (Snyder, 2020) regarding the emergence and consequent evolution of human civilizations and economic systems. Those analyses, when contrasted with the study conducted by *Silvia Helena Cardoso* about the tribal nature of our mind (Cardoso, 2001), lets us determine the strengths and weaknesses of our current economic models before *The Machine At the Crossroads*.

The currently dominant economic model is one centered on the specialized production and exchange of goods and services, as well as on the accumulation and inheritance of private property and wealth within a free market. Arguably, many of the characteristics that define this model, especially those related to specialized production, played a crucial role in the emergence of complex civilizations. It can also be argued that the competitiveness and relative cooperativeness that those characteristics provoked also contributed to fostering further technological and cultural advancements. However, this system

has a series of critical issues that make it unsustainable for the long term.

Most notably, as this economic system allows for extreme power accumulation through the acquisition, exchange, and inheritance of property, it is extremely vulnerable to the perceptive dissonance provoked by our tribal nature. As we can determine by contrasting the studies conducted by *Jared Diamond* (Diamond, 1999) with those made by *Brian F. Snyder* (Snyder, 2020), this dissonance biases all the individuals that participate in the economic system to act in favor of the short term benefit of their tribal space, and especially in favor of their closest kin, leading to the predominance of unsustainable economic practices that prioritize short term individual benefit over long term collective benefit. Arguably, most of the environmental and sustainability-related challenges of our time have been caused by this behavior is the defining characteristic of our economic model since the advent of civilizations, and especially since the first industrial revolution.

The general characteristics, strengths, and weaknesses of the contemporary economic models are explored in the chapter of the literature review dedicated to the <u>emerging economic challenges of our time</u> [5.2.2.4]. Furthermore, many of the negative accumulated consequences of said system are explored <u>in the chapter dedicated to our accumulated debts as a species</u> [7.1.3].

In conclusion those analyses, we can determine that our contemporary economic model is extremely specialized and focused on production efficiency in accordance with predictability models, but that said emphasis on specialization and efficiency stems only from a desire to maximize the immediate generation of profit at the expense of everything else, as a consequence of those taking part in the economy having their perception of reality disrupted by the tribal nature of their minds, a problem that is further intensified by the arbitrary definition of value

the system permits. **Consequently, our economic model is extremely unsustainable, socially unequal, and vulnerable to both White and Black Swans.**

A very significant part of the debts we have accumulated as a species in the last two hundred years originate in the flawed nature of this economic model, and nowadays it is becoming increasingly evident that we will have no choice but grow past it into a more sensible economic model, as all evidence seems to point out that the current model will be completely incapable of adapting to the many challenges *The Machine At the Crossroads* will unleash upon the world. Most significantly, it is evident that the unsustainable nature of the current model is incompatible with the imperative need to adopt a more responsible attitude towards nature and technology, while its dependency on predictability and specialization, summed to its focus on short-term profit over long-term planning, implies that it will be incapable of facing significant Black and White Swans. As of the writing of this dissertation, the nature of the ongoing economic crises [5.2.2.4], all of them being clear examples of White Swan events, exemplifies that vulnerability and our reaction to them portend how unprepared we are to face the upcoming automation revolution.

Much can be said about what it would entail to create a sensible and responsible form of economy. Many have already attempted to pose such a system, one of the most relevant examples of recent times being the resource-based economic model posed by *Jaques* Fresco (Fresco, 2018), but it is not the goal of this dissertation to explore that topic further, as I believe that, much like in what concerns our organizational structures, it would be way more appropriate for such a system to emerge as a result of a sensible cultural, artistic and academic revolution than as an idea created only by a select few individuals, as the former would be way more in tune with our nature than the latter.

Nevertheless, we have to consider that no matter what we do the current economic model will play a key role in determining how successfully we adapt to the first stages of *The Machine At the Crossroads* and that consequently, it will become imperative to promote and pass political resolutions that help us adapt to those changes within the framework set by moderne economics, resolutions such as the creation of a universal basic income. This is a topic that will be discussed further in other chapters of this dissertation.

7.3.3 An automaton factory: *Contemporary Academia*
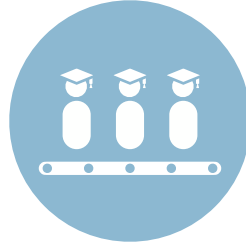
Our contemporary educational systems are also a legacy of antiquity. As *Buckminster Fuller* explained in his book *Operating Manual for Spaceship Earth* (Fuller, 1969), the original complex educational systems rose as a way to foster the hierarchization and specialization of society, a process that played a key role in permitting the formation of complex civilizations, but that proved to be increasingly vulnerable to technological evolution and environmental changes, as a consequence of education and academia being subordination to hierarchical and specialized organizational structures that have not managed to reconcile our nature with the nature of evolution and technology, a topic I explored in deep in the chapter titled *Of Campfires and Spears: The Inescapable Legacy of the Tribal Mind* [7.2.3].

This is a subject that is studied in detail in the chapter of the literature review dedicated to analyzing the nature and pitfalls of contemporary education [5.6.2.1]. What we need to understand from this analysis is that, much like our contemporary organizational and economic models, contemporary education and academia is becoming increasingly obsolete as a consequence of our hierarchical and specialized organizational structures becoming progressively less capable of growing around our tribal nature through the use of specialization and

technology, as a consequence of both societies being unable to specialize further, and of technology becoming too complex for our current organizational structures to handle.

Even then, we can argue that contemporary education and academia is already too specialized to be capable of helping individuals adapt to the crossroads. As specific professional specialization is encouraged above all else through the entirety of the educational process, much in tune with the structure of modern society as a whole, **most individuals tend to have serious difficulties when adapting to unexpected changes and challenges that affect their professional or personal life.** If we consider that the crossroads will bring forth countless challenges to the world, and that these challenges will unfold in an accelerating manner, it is reasonable to expect that **most persons will lack the necessary training to effectively face the crossroads as a consequence of their specialized training.** It is also reasonable to expect that, if that situation was to occur, both individuals and society as a whole would likely entrust the educational and academic institutions with the role of helping individuals adapt to the crossroads. **The subsequent influx of individuals seeking help, summed to the sudden need of rearranging itself into a more sensible form, would likely overwhelm academia.**

This problem is easily exemplified by the evident unpreparedness displayed by contemporary educational institutions in face of the upcoming Automation revolution, as analyzed both in the literature review [5.1.2.4] and the chapter dedicated to the challenges posed by the emerging technologies [7.1.2]. In general terms, it would be very imprudent to expect that modern academia will be capable of retraining all the individuals who lose their job to automation, especially in the initial stages of the process, because, on the one hand, the influx of unemployed individuals from automated basic professions that would likely seek more complex training would

be too extreme for the system to handle, and in the other, even if the system managed to reeducate them, the hierarchical structure of society would impede those individuals from finding new jobs, as there would be a way less significant demand for complex professions as it was for basic professions.

Now well, even if we consider that the implementation of some form of Universal Basic Income will be necessary to prevent the complete collapse of civilization as a consequence of the unfolding of general automation and the other challenges posed by the initial stages of the crossroads, the focus of contemporary education in professional specialization will likely prevent it from helping individuals adapt to a world where professional work as we understand It today ceases to exist, as ANI systems would eventually become complex enough to automate the more complex professions that form contemporary society. As professional specialization becomes increasingly less relevant and desirable as the century moves forward, **education and academia will have to redefine themselves into an environment capable of helping individuals find meaning for their lives, and a vocation that is both productive and tuned to their way of being.**

When it comes to evaluating the role of academia as an institution for research and innovation in the context of the crossroads, we have to point out that its extremely traditionalistic, hierarchical, and insular nature will limit its value as a fosterer of adaptability and sensible progress at the worst possible time, as those behaviors will artificially limit both the number of individuals that manage to become researchers and the diversity of research topics. In this regard, it is also significant to mention that contemporary western educational models will likely prove to be more capable of adjusting to the challenges of the future than their eastern counterparts, as they tend to value debate and innovation more than compliance and tradition, although those benefits could be

offset by the social upheavals their more open structure could likely provoke when the initial challenges of the crossroads start to unfold if said challenges are not handled in a sensible way.

Very relevantly, <u>as explored in the literature review</u> [5.6.2.3], the findings provided by this analysis have a lot in common with what *Andrew Rice*, *Buckminster Fuller*, *Josef Albers*, and the people of the *Black Mountain College* concluded about the state of education back in the first half of the XXth century. Those working in this institution not only managed to identify the pitfalls of contemporary educational and academic medals but theorized and proved to a very large degree that by adapting the artistic mindset and the democratic process into them most of those pitfalls could be solved, giving shape to a way more sensible and innovative form of education and academia. The Black Mountain College was ultimately forced to close by the encroaching conservative culture of mid-century USA, but I argue that their findings could prove to be key in redefining contemporary educational and academic institutions.

Unfortunately, recent attempts at implementing the artistic mindset into education have proved to be way less successful than what was accomplished at the Black Mountain College. The most relevant of these attempts, the STEAM educational model, poses integrating an arts aspect to the more scientifically focussed, and way more widespread, STEM model (Yakman, 2008). While this attempt is commendable, **I argue that this model fails to achieve what the Black Mountain College accomplished because it attempts to integrate the artistic mindset as a subject into the current model, instead of utilizing it, alongside the democratic process, as a foundation to redefine the entire academic system.**

In conclusion to this analysis as a whole, I think that we can argue that **none of the current academic models are prepared to face The Machine At the Crossroads.** I also argue that it will be essential for the long-term survival of our species that we manage to redefine them into a more sensible form that is more in tune with our nature and the nature of technology. Exploring how the artistic mindset could be used as a foundation for said redefinition will be a key aspect of my postulates.

7.3.4 A mute uproar: *Contemporary Art*

There is little else to be said about the current state of contemporary art that hasn't already been exposed and analyzed in the literature review chapter dedicated to it[5.5.2.1]. After contrasting the studies conducted by the art critic *Hal Foster* (Foster, 1995), (Foster, 2015), *Don Thompson* (Thompson, 2010) and the art collector *Sylvain Levy* (Levy, 2018), we can determine that in the present day art has become an extremely diluted discipline that is largely subordinated to the whims of globalized culture and speculative interest, with no regards towards the lives of professional artists, the artworks they create, or towards the well being of art as a whole.

In regards to the western world, and in tune with globalized culture, we can determine that art has embraced pluralism in the sense that all the artistic viewpoints that align themselves with the values posed by globalized media are accepted, but said acceptance is usually heavily biased in favor of commercial and ideological trends. As *Foster* indicates in his book, most contemporary artists still believe that art can perform a successful and positive social critique, which is a commendable attitude on its own, but he then points out that there is really nothing that contemporary art can do against the overwhelming

influence of a globalized culture that appropriates and commodifies social activism in the first place (Foster, 2015).

Foster determines that those contemporary artists that participate in the trends enacted by globalized culture only delude themselves into believing that they are conducting an effective social criticism. As the influence of globalized culture disrupts criticality and originality, artists tend to appropriate and regurgitate the ideas and stiles postulated by the social art movements of the second half of the XXth century, being oblivious to the fact that those movements, and the social criticism they managed to commit, emerged in a world that was very different from ours. Ultimately, most contemporary artistic movements are unfocused, unoriginal, and suffer from an extreme lack of criticality both in regard to the world at large and themselves. Most of them, and the artists that compose them, are subordinated to the influence of globalized culture and the speculative markets, their value is reduced to a merely economic one to be traded by high-level investors. As *Sylvain Levy* explains (Levy, 2019), the subordination of artists to the interests of speculative markets, summed with the communicative transversality allowed by the social networks, has turned the contemporary western art world into an extremely polarized and hyper-competitive environment in which artist can completely bypass the traditional art institutions and channels, transforming both artworks and artists into mere commodities to be traded and speculated with.

If we contrast this analysis with the one conducted by Foster, we can obtain a complete picture of the current state of the contemporary western art world: **a rat race determined almost exclusively by the whims of speculative investors and social networks, an echo chamber in which most artists just want to become popular, but in which no one has anything truly relevant to say in regard to themselves or the state of the world at large.** Moreover, it is increasingly evident that traditional art

institutions and agents are becoming obsolete in the face of the
encroaching influence of social networks, because these networks
offer artists an alternative and less expensive way to expose
and commercialize their works.
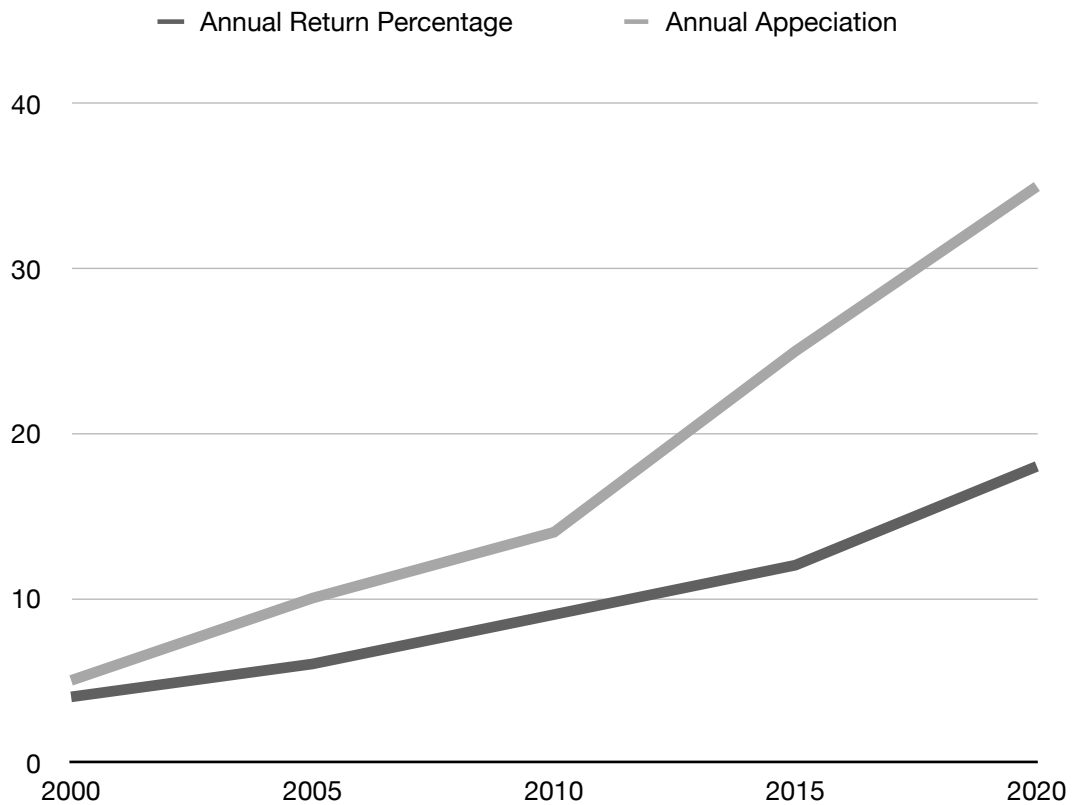
Evolution of the return on investment in art, based on (Hedonova, 2020)

While it is true that this new environment affects the newer
generations of artists the most, for they have not experienced a
world in which social networks have not been ubiquitous, **its
influence encompasses the entirety of the art world.**
Consequently, most artists, young or otherwise, have to either
participate in the popularity contest that the art markets have
become, or combine their work as professional artists with other

jobs to remain financially stable. In both cases, artists are forced to comply with the moral and social standards set by globalized culture, no matter how biased and market focused those morals might be, at the risk of being vilified by the social networks otherwise. Even then, among those artists that choose to participate in the social media-dominated art sphere, only a handful of them end up being noticed by speculative investors and become truly economically successful, a fact that exemplifies that in the western world, art as a whole has become a mere speculative commodity, an aspect of globalized culture devoid of true personal or cultural value.

On the other hand, <u>as explored in the literature review</u>[5.5.2.1], **in the parts of the world that are dominated by the eastern culture, and especially by the emerging globalized Sino-culture, things are not better for the art world, but for different reasons.** As china's influence and culture continue to propagate through developing countries in the coming decades, so will their policies regarding art. **Under the said influence, artists and artworks will become mere political tools utilized only to reinforce a narrowly defined ideological perspective, with no real space for critical thought or creativity.** In turn, this leaves the emerging artistic environments from developing countries in a position that can only be described as being between a rock and a hard place, as they will either end up falling within the influence of western or Sino-centric values, impeding them from becoming their own independent environments and thus diluting artistic and cultural diversity further.

In conclusion, I argue that the contemporary art scene, for all its sacrifices, has very few redeeming qualities. For a discipline that, as Hal Foster poses, should play a key role in helping us elaborate a sensible perception of actuality (Foster, 2015), **it has largely become the playing field of a select few speculative investors that have no respect for anything but for their personal riches.** What is also significantly saddening,

however is that, even if art has historically been at the forefront of technological, cultural, and social innovation, contemporary art remains largely separated from the true opportunities and challenges brought forth by the new emerging technologies of our time, as, baring some examples, contemporary artists tend to utilize these technologies more as a mere backdrop than as a language from which to conduct their work, with the few artists that do utilize the emerging technologies sensibly being the exception that confirms the rule.

Unfortunately, I have to argue that there is no real space in today's world for those artists that are dear to think for themselves, especially if they dare to try to live just from their work as artists, no matter where in the world they are born. There is not much more space for those cultural agents and institutions that played a key role in shaping the art world of the late XIXth and XXth centuries, for the social networks have made them obsolete in the new hyper-competitive and diluted art market, a trend that will likely lead to their eventual complete dissolution, unless if they manage to find a new space for themselves.

Regarding the western world, I argue that as the older generations of artists start to be eclipsed by the newer ones, art galleries, art collectors and museums will progressively fade away into the cacophony that is globalized culture. Those younger artists will continue to compete among themselves, regurgitating what the older generations accomplished in a desperate attempt to catch the attention of the social networks and speculative investors, forgetting who they are, or what art is supposed to be, in the process. Those who find themselves living under the influence of the emerging globalized Sino-culture will not fare better, as they will be forced to comply with the government-sanctioned cultural mindset at risk of being censored otherwise.

Whether we like It or not, I argue that contemporary art has become so entangled with the globalized cultures and speculative markets that there is little that can be done to liberate it from their influence. For that same reason, I also argue that there is little that contemporary mainstream art will be able to do to help us overcome *The Machine At the Crossroads*, as it is too distanced from the real state of the world to be relevant. What is more, I argue that as the globalized cultures and contemporary economic markets start to become obsolete as a consequence of the crossroads, so will contemporary art start to dissolve until nothing of it remains, for better or worse. However, I believe that there is still much that those artists that dare to think for themselves could do in the present day, both in regards to facing *The Machine At the Crossroads* and solving the current state of the art world, a topic that I'll explore in deep in the postulates section of this dissertation.

7.3.5 A deafening silence: *Contemporary Culture*

In the literature review, I explored and exposed the three main aspects that define contemporary culture, those being the nature of the culture of the information age[5.4.2.1], the growing confrontation between the western and the eastern globalized culture models[5.4.2.2], and the timid emergence of alternative cultural movements[5.4.2.3]. Taking that analysis as a basis, we evaluate the current state of contemporary culture by contrasting it with my analysis of the nature of our species [7.2.3] and the nature of The machine at the crossroads[7.1].

Based on these analyses, **I argue that contemporary culture is largely under the influence of the globalized culture models**, with the North American-born western globalized culture being the most influential overall throughout the developed world, and with the emerging Sino-centric eastern globalized culture slowly becoming more relevant as China's influence over developing countries starts to grow. As I previously explored, these globalized culture models have striking differences: the western one, which propagates mostly through commerce, social networks, and mass media, tends to assimilate, trivialize and commodify the smaller cultures it encounters. The eastern one is starting to propagate mostly through the exportation of advanced information technologies, industrial knowledge, and political

ideals and is mainly focused on overwriting the cultures of developing nations with Sino-centric values and tenets, a development that is comparable to how the ancient Chinese empire managed to impose its culture to its surrounding areas thanks to their monopoly of writing and administrative techniques (Diamond, 1999,p. 322-334)[10.3.1.18].

Arguably, even if they are significantly different from each other, **both globalized culture models contribute, or will soon contribute, to the dilution of cultural diversity worldwide.** While this is more evident in developed western nations as a consequence of western globalized culture already being well established in them, it is only a matter of time before the emerging eastern globalized culture becomes just as influential in the rest of the world, as a consequence of a very significant number of developing nations choosing China as their technological and ideological sponsor because of the latter's recent economic and industrial success. It is evident that cultural and ideological diversity will continue to plummet worldwide in the following decades, as these two cultural behemoths will leave little space for smaller cultures to exist. The potential eruption of a large-scale cultural confrontation between these two groups would worsen this situation even further, as it would leave the smaller cultures trapped in the crossfire.

Western Globalized Culture
Assimilates and commodifies specific cultures.

Specific Cultures

Eastern Globalized Culture
Imposes itself over specific cultures.
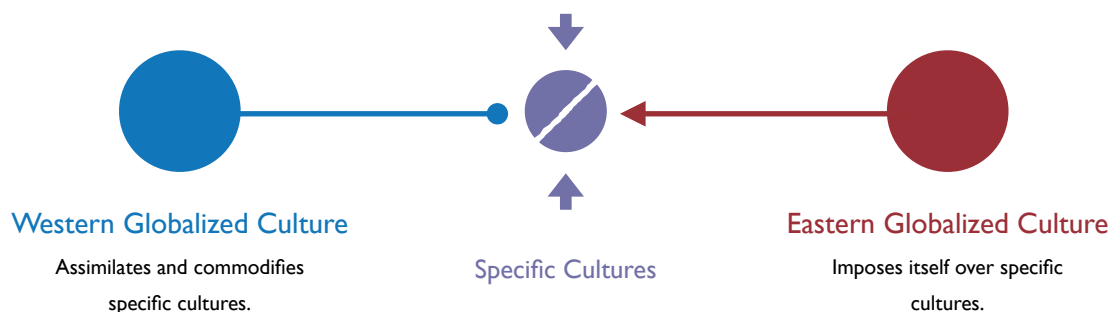
Western vs Eastern globalized cultures, diagram

It is also very significant to mention that both cultural models enjoy an extreme level of communicative reach and transversality thanks to their utilization of modern information and communication technologies, with special importance given to social networks. As a consequence, the cultural spaces they form are vast and highly homogeneous at the same time, a type of environment that, as *Jared Diamond* explained in his analysis of the rise of the ancient Chinese empire (Diamond, 1999,p. 322-334)[10.3.1.18], **can only lead to cultural and technological stagnation.** The emergence of smartphones and wireless communication technologies also played a key role in shaping this social and perceptive space, as they allowed the system to permeate almost every part of our lives.

Arguably, this environment exists in complete opposition to our tribal nature, as our minds can only sensibly process the social and administrative information that would concern a tribe composed of a few hundred individuals[7.2.3]. The contemporary social networks instead force us to live in a social space where billions of individuals are forced to coexist to a lesser or larger degree, and even if most persons do tend to form social groups comparable in size to tribes within those networks, most of those relationships are constructed in a very superficial manner that is extremely distanced from our nature. Similarly, these cultural and information spaces force an apparently universal perception of the world into us, an amount of information that our mind is in no way prepared to handle in a sensible way. When those two aspects are added to the commercially or politically biased nature of most social networks, it comes as no surprise that most of those who utilize them in their everyday lives, and especially those who were born after said networks became widely used, end up developing an extreme case of perceptive dissonance towards almost everything that scapes their most immediate perception. In turn, **the combination of these factors causes a generalized trivialization**

and infantilization of personality, social relations, the perception of the world, and responsibility, factors that lead to the generalization of perceptive dissonance, apathy, and sociopathy.

For the most part, this is a type of environment that permeates most of the developed world, both in the west and the east, and we can expect that as portable communication and computing devices start to be adopted by developing countries on a grand scale in the following decades, they too will eventually fall within the influence of either of the globalized culture models. For similar reasons, we can expect that if our global stance towards culture remains unchanged, the eventual emergence of the *Internet of Things* technologies will worsen this situation even more.

Arguably, **the development and utilization of big data-based surveillance and social control systems will be the worst offenders in that regard,** as their implementation will likely transform the social space into a nightmarish credit-based environment in which your standing as a citizen will be directly linked to how compliant you, and those with whom you interact, are with the established social norm. This last scenario is clearly exemplified by the Chinese government's continued attempts to implement a social credit system (Drinhausen and Brussee, 2021), and by the increasing attempts made by western corporations to create big-data-based social environments such as the proposed Meta-Verse (Folgen, 2021).

I argue that, if things are not to change for the better, we can only expect that globalized cultures will become progressively more prevalent and influential in the coming decades throughout the entire world, ultimately leading to the shaping of an environment in which practically all the individual cultures and ideologies of the world are assimilated or overwritten by them, thus being transformed into mere

commodities if they fall within the influence of western globalization, or dissident ideologies if they fall within the influence of eastern globalization. In this scenario, most individuals would be forced to become a part of one of those environments at the risk of becoming social pariahs otherwise, therefore trivializing human life, and diluting cultural and ideological diversity further.

If we compare this analysis with the nature of *The Machine At the Crossroads*, we can easily determine that not only are the globalized cultures grossly unprepared to overcome the challenges the future will pose, but that **their influence will likely compromise our species' ability to adapt to those challenges.** Much like contemporary art, contemporary culture is entangled with the socio-political and economic structure that defines the present-day world. However, I argue that it will be way harder to help it evolve into a more sensible form because of its emergent nature, as the creation of a more sensible form of culture would require the redefinition of the entirety of our civilization.

On the bright side I argue that, because of said emergent nature, **a sensible form of culture would manage to dynamically optimize our handling of the challenges posed by the future in a natural and progressive way,** something that would significantly increase our chances of overcoming the crossroads. This is a topic that will be explored in detail in the postulates section of this dissertation.

7.3.6 A Short-Sighted Leviathan, Conclusions

How prepared is contemporary civilization to face the challenges posed by *The Machine At the Crossroads*? Arguably, not prepared at all. For all we have accomplished in the last 10.000 years we have forgotten, or perhaps, choose to forget, what our true nature is, and in doing so we have created a world that is increasingly in opposition to itself. We chose to believe that technology alone could help us grow past our nature without repercussions, and while our use of technology did indeed let us create an advanced civilization, said civilization came to be in spite of our nature instead of being in tune with it.

Despite all our technological achievements and social constructs, we are still defined by our tribal minds, and consequently, all the choices made by every individual who composes our civilization are biased in favor of what they perceive as their tribal space. Arguably, this is the root cause of many of the debts we have accumulated as a species, and one of the main reasons why we are so unprepared to face the crossroads, for all the choices we will make in regard to it will be conducted from said distorted perception, a problem that is significantly worsened by the extremely hierarchical and specialized structure of modern societies.

What is more, our tribal nature is also at odds with the nature of technology itself, for technology progress at an exponential rate, yet we can only adapt to it in a linear way that depends on our capacity to create increasingly specialized social structures that can help us process the ever-growing amounts of information generated by technological evolution. However, this process has proven to be extremely flawed, as each

significant adaptational stage has made us progressively less capable of adapting to unexpected unaccounted-for changes, including technological evolution, leading us to our current situation, a situation in which we might not be able to adapt to unforeseen impactful events or the new emerging technologies at all. As a species and civilization, we have simply grown ourselves to a position in which we might not be able to overcome the challenges the future might pose, because our perceptive dissonance makes us incapable of perceiving said future effectively, impeding us to take action against those challenges in a reasonable manner.

What *The Short-Sighted Leviathan* reveals to us is that, in its current state, our civilization is unprepared to face *The Machine at the Crossroads*, while also revealing that the root cause of this problem resides in the fact that we have not been able to reconcile our tribal nature with the nature of technology and civilization. I argue that, if those two natures are not reconciled with each other before the more severe aspects of the crossroads start to unfold, we might not be able to overcome it. Fortunately, this analysis, when contrasted with the other analyses realized in this thesis, provides the keys necessary to devise a sensible redefinition of art, culture, and academia that could help us reconcile them in time.

There is however one last topic we need to analyze before those redefinitions can be conceptualized. While *The Short-Sighted Leviathan* exposes the shortcomings of contemporary civilization in the face of the crossroads, we still have to account for the preemptive actions we are attempting to take against it, for better or worse. The following chapter, titled *In Search of Synthetic Gods*, will explore this topic.

7.4 Argument IV: In Search of Synthetic Gods
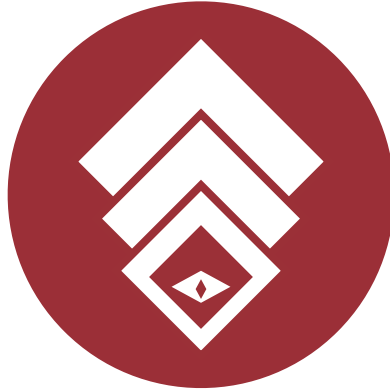
It would be extremely naive to believe that the topics so far explored in this dissertation would be unknown to those that, nowadays, set the course of civilization. Similarly, it would be just as naive, if not more, to believe that those individuals would not attempt to take preemptive action against the crossroads. However, I argue that it would not be naive to believe that, independently of the intentions and motivations of these individuals, their actions will be conceived from an extremely disrupted perception of the world and the future that is heavily biased in their favor, as a consequence of their tribal nature is at odds with their privileged position in human hierarchy. While this statement might appear to be a value of judgment, I refute said accusation by pointing out that, as *Buckminster Fuller* explored in his book *Operating Manual for Spaceship Earth* (Fuller, 1969), history has demonstrated time and time again that this is how those in power handle events similar to The Machine at the Crossroads.

In this chapter, I will explore the preemptive actions that contemporary civilization is likely going to enact in the following decades in preparation for the machine at the

crossroads, thus obtaining the last piece necessary to complete the framework from which to construct my artistic, cultural, and academic postulates.

What research questions does this argument address?

- Much like the previous argument, this one addresses ***my Contextual underlying research questions focused on the emerging technologies***[3.5.1], ***my Contextual underlying research questions focused on the emerging challenges of our time***[3.5.2], and my ***core contextual questions***[3.5.3], as it takes the previous arguments as a foundation to determine how contemporary civilization would likely attempt to prepare for the crossroads if contemporary cultural and socioeconomic tendencies are do not evolve into a more sensible form.

The Universal Basic Income

The implementation of a Universal Basic Income system.

Human Augmentation

The utilization of genetic and cybernetic engineering to enhance the capabilities of human bodies.

The New Panopticons

The implementation of new generation surveillance systems.

In Search of Synthetic Gods
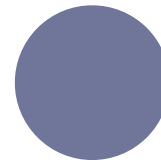
The evaluation of the readiness level of contemporary human civilization against The Machine at the Crossroads.

The Metaverse

The creation and utilization of large-scale fully immersive Virtual Realities.

Contemporary Policies

The implementation of policies focused on countering the challenges posed by the future.

Governance Through Ai

The utilization of AI in governance and administration as a response to technological evolution.

In Search of Synthetic Gods, outline

7.4.1 An expected equalizer: *The Universal Basic Income*
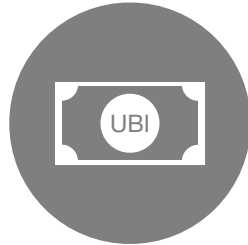
From all the grand-scale society redefining reforms that we might have no option but to implement in the near term future, the Universal Basic Income will more than likely be the one to be enacted first, as, arguably, only by doing so will we manage to avoid the complete collapse of contemporary economic and social structures as a consequence of the first stages of *The machine at the Crossroads*. As I explored in the chapters dedicated to the crossroads[7.1] and the current state of our civilization[7.3], it is very likely that our current economic and commercial system will be unable to sensibly adapt to the challenges posed by the crossroads, forcing us to redefine them. Consequently, it would be reasonable to expect that socio-economic disruptions said the process would bring would be extremely detrimental to the economic stability and independence of both nations and specific individuals in a historically unprecedented manner, causing inequality, social upheaval, and conflict to rise throughout the entire world.

In that context, the Universal Basic Income is conceptualized as a way to keep such a development from reaching a critical point of no return. While many different definitions of UBI exist, most of them pose a similar system: to

redistribute wealth to unconditionally grant every individual within a given economy a monthly economic aid equivalent to the minimum wage specified within said economy, independently of the professional status of the individual, with the intention of equalizing the baseline of the economy in a way that would theoretically eliminate poverty while also providing those who find themselves suddenly unemployed with an economic buffer that would prevent them from becoming helpless, without compromising their desire to want to find another job.

If we consider the nature of the challenges the crossroads will bring forth, and especially if we consider the mass unemployment that the emergence of Artificial Intelligence technologies will cause, it becomes evident that the worldwide implementation of a UBI system will be unavoidable, as social unrest would likely skyrocket if such a system is not implemented. However, while the general concept of what a UBI should entail is clearly defined, how such a system could be financed and implemented is a very divisive topic, as many are afraid that it would drastically increase inflation.

As analyzed by the *Stanford Basic Income Lab*, in the last years, many UBI trials have been conducted to evaluate its effectiveness and possible unwanted effects, both in developed and developing countries, and so far most results have been conclusively positive: not only did UBI manage to alleviate poverty in a very significant way, but it also managed to improve their professional independence and access to health care and education, all without reducing the participation of those individuals in the job market. What is more, **the economic independence provided by the UBI plans contributed to improving the working conditions of those benefited by the plan**, as said economic independence permitted them to leverage better working conditions or even allowed them to start their own businesses (Hasdell, 2020). By contrasting this study with another one conducted in Mexico in 2017 (Matthews, 2017), we can conclude

that in most of the trials that have been conducted so far, **the inflationary effects of UBI have apparently been extremely mild, with the positive effects of the program far exceeding the increase in prices.**

However, as encouraging as these results might appear to be, **it is important to mention that all of them have only been conducted with limited population samples.** So far no community or country-level UBI trials have been conducted, and we won't be able to perceive whether UBI can truly work at said levels or not until we do so. The only significant large-scale implementation of a system similar to UBI in recent history has been the state of Alaska's dividend system, a program that not only contributed to reducing the poverty of those living in the state but also managed to reduce the inflation of its economy (Santens, 2014). However, even that example is an isolated one.

In any case, the truth is that **we will eventually have no option but to implement a UBI system throughout the world, which makes determining how such a system could be implemented sensibly a priority.** Some argue that an inverse tax system would be the best way to finance a UBI, while others defend that it would be better to implement the system as a form of a universal dividend, similar to Alaska's case (Straubhaar, 2017), (Fisher, 2022). Likewise, there exists much division between nations in regards to whether UBI should exist independently of welfare systems or if it should substitute for them (Fisher, 2022). On the other hand, many others argue that a UBI system will only become feasible when automation starts to unfold into the world because, on the one hand, the generalization of automation would create a prime candidate for taxation, the automatic workforce, while on the other it would also eliminate any inflationary effects from UBI as a consequence of the increased efficiency reducing the general costs of production, administration, and logistics (Miller, 2021).

It is evident that, unless a universal consensus is reached in regards to how UBI should be implemented, we might end up unleashing a system that, while effective in preventing the social and economic crises that would otherwise emerge in the first stages of the crossroads in a country per country basis, it would only contribute to further rise inequality in regards to the international scene as a consequence of its fractured nature. However, I argue that even such a fractured UBI system would be preferable to no UBI at all, as the social and economic consequences of not implementing it could be potentially catastrophic for our entire civilization. I defend that, ideally, a UBI would have to be designed and implemented by universal consensus between all affected parties, but the chances of that occurring if we consider the current state of the world is regrettably small.

Lastly, we also have to consider that, **while a successfully implemented UBI will more than likely prevent an otherwise inevitable collapse of the worldwide economy as The machine at the Crossroads starts to unfold, it will not manage to fix the underlying economic and socio-cultural problems that define our civilization in the present day.** Most significantly, if automation does become so advanced and generalized that automated systems end up overtaking most of the currently existing human professions, UBI alone will more than likely not be enough to give the individuals displaced by automation a new meaning for their lives. Similarly, while UBI would alleviate poverty and significantly reduce social inequality, it would not manage to prevent extreme wealth accumulation and misuse just by itself, nor would it contribute to making the economic system more sustainable.

In the end, what we have to understand is that UBI will essentially work as a patch for our current economic system, a temporary solution that will prevent the complete collapse of the economy when the challenges posed by the future start to unfold. Eventually, we will have no choice but to sensibly redefine our economic models if we are to overcome *The Machine at the Crossroads*.

7.4.2 Under a technological all-seeing eye: *The New Panopticons and Social credit Systems*
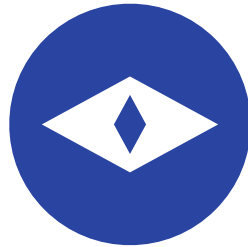
If there is one thing that we can truly expect from the unfolding of *The Machine at the Crossroads* is that it will be extremely tumultuous. As I explored in <u>the chapter dedicated to analyzing the crossroads</u>[7.1], each one of the challenges that will compose it has the potential to radically disrupt social order and economic stability, with many of those events, such as the senseless proliferation of the new emerging technologies or the destabilization of the climate and biosphere of the Earth, being capable of directly endangering the lives of individuals. Given that it is very likely that a very significant number of these events will occur concurrently with each other, it would be reasonable to expect that most contemporary societies wouldn't be able to cope with the public unrest that would arise from them.

As I explored in the part of <u>the literature review dedicated to studying the emerging surveillance systems of our time</u> [5.2.2.6], most contemporary developed nations and organizations seem to be well aware of the unprecedented amounts of social unrest and critical security risks that could emanate from the challenges the immediate future could pose, and are evidently trying to prepare for such occasions by developing new generation surveillance and social control systems. Arguably, what is also evident is that,

while developed democratic nations are conducting this process in a way more conspicuous way than developed authoritarian ones, both groups are attempting to create a similar security system: a universal surveillance and surveillance network that would tie the lives of individuals and the environments they inhabit into itself, by utilizing emerging computing, sensorial, and automation technologies (Davies, 2021).

The most evident example of this development is no other than the social credit and control systems that the Chinese government has been attempting to implement throughout their entire territory in the last years (Davies, 2021), an still under development surveillance and social control network that puts the very lives of those who live under it under constant analysis and evaluation, linking the social status of those it evaluates to their compliance with the country's laws, culture, and ideology. **The Chinese government argues that the creation of such a system was unavoidable as a consequence of their increased population numbers and general technology level**, citing the recent pandemic as an example of why implementing it would be desirable for all the population (Plavevski, 2021). However, **many argue that this surveillance and social credit system is being created very arbitrarily, remarking the potential abuse that could stem from its use**, similarly pointing out that the senseless utilization of the emerging computing and technologies that the creation of this system implies will more than likely have very significant collateral consequences (Davies, 2021).

While in democratic developed nations the direct implementation of surveillance systems similar to the one discussed above is largely out of the question, as most individuals would perceive such developments as extremely authoritarian, **a very significant number of technology companies are already developing such systems in indirect manners:** from the encroaching influence of the social networks (Scott Pelley, 2021), to the smart-city projects conceptualized by Alphabet, a

social control and surveillance system not that different from the one being implemented in China is slowly taking shape (Muggah and Walton, 2021). If we consider that the COVID pandemic has significantly increased the general acceptance of surveillance policies in these countries (Poetranto and Ruan, 2021), I argue it is only a matter of time before these separate social control and surveillance systems coalesce into a more concrete network.

Now well, <u>in my analysis of The Machine at the Crossroads</u> [7.1], and especially in the part dedicated to <u>studying the challenges posed by the emerging technologies</u>[7.1.2], I argued that the future would leave no choice but to implement a form of universal surveillance system to counter the risks posed by the crossroads, but **I argue that neither of the ongoing attempts are adequate in this regard.** Both eastern and western surveillance and social control models attempt to achieve social security and stability and stability by creating a controlled environment that conditions the individual to comply with social order down to the personality level at risk of becoming a social pariah otherwise.

Both models would oversee every citizen on a constant basis, in an extremely invasive way, and would treat anyone who would not want to participate in standard society as a threat. On top of all of that, both models would make excessively extensive use of sensorial technology, big data, and algorithmic systems, significantly increasing the vulnerability of society in the face of White and Black Swan events, while also significantly increasing the dependency on Ai systems as a consequence of the increase on the data load that would have to be processed to maintain society running. Above all else, however, **these systems would further centralize governance and decision-making while also contributing to homogenizing culture, thus increasing the gap that exists between our tribal nature, the nature of technology, and the nature of civilization even further.**

Evidently, this would decrease our chances of overcoming the crossroads even more.

However, while I argue that these surveillance systems would not be sensible, and much less ethical, **I recognize that they would be preferable to having no surveillance system at all,** for that could unleash some of the most destructive consequences of the crossroads. Nevertheless, if we truly want to overcome the crossroads in a truly successful and humane way, **we will have to find a way to develop an ethical surveillance and Sousveillance system that is tuned to both our nature and that of technology.** While it is not the goal of this dissertation to conceptualize such a system, I hope that my artistic, academic, and cultural postulates contribute to its eventual definition.

Western Surveillance

Corporate and state-based. Individuals accept surveillance in exchange for convenience and security.

The new Panopticons

Eastern Surveillance

Mostly state-based. Surveillance is imposed in order to assure social order.

Both utilize the new computing and communication technologies very extensively. Most aspects of surveillance are automated.

Western and Eastern surveillance systems, diagram

7.4.3 A realm within, a realm without: *The False Promise of the Metaverse*
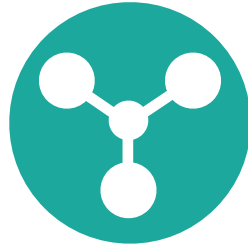
Nowadays there is much expectancy about what <u>The Internet of Things</u>[5.1.2.7] and <u>Virtual Reality</u>[5.1.2.8] might end up unleashing upon the world: a melding of the physical world and the virtual like we have never seen, a redefinition of what we experience and understand as reality, the birth of a new environment that would integrate the tangible and intangible aspects of the contemporary world. That is precisely what the IoT and the Virtual Realms will be, environments for us to live in, for better or worse.

In the context of the crossroads, and especially in what concerns <u>the debts we have accumulated as a species</u>[7.1.3], these technologies will offer us a unique opportunity to lessen the impact that our contemporary consumerism-based economic doctrines have on the environment: by migrating most of the social, recreational and cultural aspects of our economy into an environment that is either completely virtual or that exists as a virtual environment superposed to physical reality, we can drastically decrease the number of pollutants these economic doctrines produce. To a very significant degree, this has already been happening through the emergence of the internet and social networks, but I argue that *The Internet of Things* and *Virtual Reality* will drive this process further, **up to a point**

in which practically all non-vital economic, recreational and cultural activities are conducted within the purely virtual or mixed reality realms.

This is a process that would be extremely beneficial to the health of the Earth's climate and biosphere, thus why I argue that it is increasingly evident that the significant power groups of the world are pressuring to develop such an environment. Consequently, I argue that by the midpoint of this century at the latest the IoT and the Virtual realms will become as defining to the everyday lives of developed countries as the internet, the social networks, and smartphones are today, with the rest of the world following suit slowly as the rest of the century progresses.

However, I also argue that, if the current cultural trends don't shift into a more sensible form beforehand, the emergence of the IoT and the Virtual realms would be extremely detrimental to both culture and the mental state of individuals, for they would likely be shaped as an extension of the communicative environments provided by the social networks, while also being extremely more immersive and impactful. As I explained, the social networks themselves provide a social space that senselessly exploits our tribal nature with a merely commercial and ideological goal, <u>significantly increasing the perceptive dissonance that defines contemporary civilization</u>[7.3.5]. Consequently, I argue that if the IoT and Virtual networks are shaped in a similar manner, said dissonance will grow even further.

In a very significant part, it is in this context that I'll pose my artistic and cultural postulates, as it is in those environments where a sizable part of the culture of the world of tomorrow will be shaped.

7.4.4 A paper umbrella against a hurricane: *Contemporary Policies and the Climate Destabilization*

That the climate and biosphere of the Earth are destabilizing at an increasing rate as a consequence of human activity through the last centuries <u>is one of the most saddening and terrifying realities of our time</u>[7.3.5]. This one is, by far, one of the most critical challenges posed by The Machine at the Crossroads, which makes tackling it a matter of utmost urgency. As it appears, the international community has finally started to take the problem seriously, but I argue that the solutions they are proposing, while better than nothing, are extremely biased in favor of maintaining our contemporary economic and industrial structures unaltered, at the expense of the general population, and especially of those who live in developing countries.

Similarly, the prevalence of unsustainable economic doctrines throughout our history has led to our civilization reaching a point in which we have almost outgrown the carrying capacity of our planet, putting our civilization dangerously close to the point of economic and social collapse, something that is becoming increasingly evident in recent times (Curious, 2017), (Nowodziński, 2021). However, as I explored in the sub-chapter titled *A tower built upside down: Contemporary Human*

Economic Systems[7.3.2], everything seems to point out that contemporary governmental and corporate institutions have no interest on departing from the unsustainable economic practices as quickly as they should, thus leading them to enact sustainability related reforms in a way that is extremely biased in their short term favor, at the expense of loading the general population with the burden of making the global economy more ecologically friendly and sustainable.

In regards to the mid to long-term future, it would not be unreasonable to expect that world powers would attempt to utilize Geo-Engineering technologies[5.1.2.16] to counter climatic destabilization, a development that I argue would have terrifying consequences if we consider that those technologies would likely be utilized in haste, but these technologies are so early in their development that it is not feasible to theorize about what consequences an insensible utilization of them would have beyond damaging the climate and ecology further.

What we should expect in the following decades is that **the world economy will progressively transition into a model based on the taxation of ecologically harmful or generally unsustainable practices**, theoretically leading institutions and individuals alike to adopt more sustainable economic practices (TWB, 2020). However, **I argue that, unless the technologies that permit sustainable development are shared throughout the world in an equal manner in the near future, developing nations, especially their populations, will suffer way more significant setbacks to their economic and social development than their more developed counterparts.**

Nevertheless, the unfolding of these economic reforms will likely be critical to the economies of the short-term future, and I'll have them in significant consideration when defining my artistic, cultural, and academic postulates.

7.4.5 Mirages of a brave new world: *Human Augmentation*

As I explored in the literature review, and <u>in the chapter dedicate to the crossroads</u>[7.1.2], from all the technologies that will define the coming decades <u>Genetic Engineering</u>[5.1.2.9] and <u>Cybernetic Engineering</u>[5.1.2.10] have the potential to alter our own nature the most. These technologies will not only allow us to cure genetic diseases and disabilities that have been untreatable so far, but they will permit the rewriting and augmentation of our biology and capabilities, offering us the possibility to pursue the transhumanist path as a solution to the crossroads.

When these technologies reach a certain maturity in the foreseeable future, they will drastically alter the human condition, for they will allow us to, among many other things, **reverse and cure the aging process, make us impervious to most known diseases, modify and enhance our biological characteristics and abilities with great precision, and hybridize our biological bodies with mechanical constructs and information networks.** Evidently, if used sensibly, these technological advancements would significantly improve human lives, which will push their development and utilization as a way to combat the emergence of novel diseases. However, if we consider the current state of the world, and especially the social inequalities that already define

it, one has to put into question if the more advanced forms of these technologies will not make those problems even worse.

As many studies seem to point out, the reversal of the aging process will more than likely be the first of these developments to be unleashed into the world, alongside the procedures capable of curing diseases and medical conditions from their root cause (Kleeman, 2021). While we can not precisely calculate how much human life span and health span would increase after these treatments are refined, most experts seem to agree that, at a bare minimum, they would allow individuals to live well into their mid-140s with a body state and health comparable to that of a young individual (Berzin, 2020). However, if we consider the accelerating nature of technology, especially in the context of the crossroads, **it would not be that far-fetched to expect that these advancements will eventually permit us to achieve biological immortality,** which would mean that, if the right treatments are undertaken, no human being would ever die of old age, remaining forever young. Even then, only the future will tell if such advancement is at all possible, but **even the simpler applications of these treatments would have extremely impactful consequences for the world.**

As analyzed in the literature review[5.1.2.9], in the context of the contemporary socio-politic and economic scene, I argue that the advent of age reversal treatments will be as tumultuous as it will be unavoidable. For one, these treatments have the potential to very significantly improve and expand human lifespans and health spans, which is something that can simply not be hidden or restricted from the general population by those who occupy the higher echelons of human society, for doing so would more than likely lead to never seen before amounts of social unrest and conflict to rise through the entire planet. Therefore, if we assume that these treatments will become progressively available to all human beings (as I argue that the alternative would likely lead to the complete collapse of

civilization, for as much as science fiction literature loves to pose scenarios in which only a select few humans overcome aging at the expense of everyone else), **we will have to account for a new world state in which individuals can live, at the very least, twice as long as they can live now, potentially more, or even forever while remaining fiscally and mentally young.**

I argue that the logistical and resource-related issues that would arise from a generalized utilization of these treatments will be one of the defining crises of the mid stages of The Machine at the Crossroads, as **the increase in longevity would significantly increase our need for resources** and would demand the universal adoption of more efficient and sensible economic practices and a step decrease of the global reproduction rates. However, **the cultural challenge this development would bring forth would be just as important, for the increase in life and health spans would likely decrease cultural and technological innovation.** Exploring how art, culture, and academia could be redefined to help us overcome that problem will be a very important part of my postulates.

In what concerns the rest of the applications of genetic and cybernetic engineering, body modification, and augmentation, I argue that **their unfolding will likely be comparable to that of age reversal and illness elimination treatments:** if these technologies are not distributed evenly through society, the rise on social inequality that would stem from such an occurrence could potentially cause extreme amounts of social unrest and conflict, especially in what concerns intelligence augmentation technologies. On the other hand, **I argue that if body modification technologies become commonplace within the environment set by the globalized cultures <u>as defined in the previous chapter</u>**[7.3.5]**, the genetic diversity of our species would decrease even more as a consequence of the homogenizing influence of said cultures,** as most individuals would feel

inclined to adopt body forms that are tuned to what is trendy or socially accepted.

That development would be significantly more disruptive in regards to our minds, for genetic and cybernetic engineering will allow us to modify and enhance them directly. Wouldn't most individuals, pressured by one of the two globalized cultures, choose to voluntarily tweak their brain structures to make their mindset more compatible with the social norm? Wouldn't authoritarian regimes force their citizens to modify their minds to make them more compliant, whether directly or indirectly, with the pretext of guaranteeing social stability and order? Wouldn't the hyper-competitive economic environment that defines our contemporary world force individuals to pursue the enhancement of their mental capabilities at any cost, increasing social inequality further? All of these are very concerning scenarios that have so far been explored extensively in science fiction literature, and I for one hope that we never end up making them a reality.

We also have to account for the applications of these technologies beyond the modification of already existing human beings: from the engineering of task-tailored humans to the uplifting of animal species or the creation of entirely new lifeforms, genetic and cybernetic engineering will radically shift how we understand and interact with living beings, but **I argue that, unless we manage to reconcile our own tribal nature with the nature of technology, we will not manage to make sensible use of them.** Ultimately, these technologies will be the ones that will offer us the possibility to enhance our minds and bodies as a way to remain relevant in the face of the crossroads, but it is becoming increasingly evident that if we embrace this path insensibly, we will only manage to further widen the gap that exists between the whole of our species and technology, significantly decreasing our chances of successfully overcoming the challenges the future will bring forth.

In any case, I argue that if they were sensibly redefined, art, culture, and academia would significantly contribute to the responsible utilization of these technologies, which would dramatically increase our chances of overcoming the crossroads.

Aging Reversal Technologies

Ethical to develop and distribute. It would be impractical to restrict it. Would force us to adopt sustainable practices. Would radically change human culture.

Human Augmentation

Ethically complex. Contemporary culture will have a significant influence in its unfolding, for better or worse.

Synthetic Life Creation

Ethically questionable. Likely unavoidable. Could redefine our world, for better or worse.

Intelligence Augmentation

Ethically complex. A core aspect of transhumanism. Would be unwise to commit to it without having previously reconciled our tribal nature with the nature of technology.

Human Augmentation, diagram

7.4.6 Leviathans by algorithm: *Governance Through Artificial Intelligence*

There is one last significant aspect of the crossroads that we have to account for to determine how contemporary civilization is preparing for it: our increasing inability to properly utilize technology the more advanced technology becomes, as a consequence of our tribal nature limiting our capacity to process and control extreme amounts of information. This is a topic that I have explored in detail both in <u>my analysis of our tribal nature</u>[7.2.3] and in <u>the sub-chapter dedicated to exploring the nature of contemporary human organizational structures</u>[7.3.1], with them revealing that the exponentially increasing complexity of technology, summed to our inability to conventionally specialize our civilization further in order to be able to process the amounts of information the new emerging technologies will generate, would inevitably lead to a catastrophic technological overload in the foreseeable future unless we managed to find a way to solve the problem beforehand.

I argue that it is reasonable to expect that those who occupy the higher echelons of our contemporary organizational structures are well aware of this problem and that they are already attempting to preemptively solve it in a very specific way: through the development utilization of Artificial

Intelligence. I argue that this is something that becomes evident if we compare the emerging Artificial Intelligence focused technological race (Savage, 2020), <u>with the interest that many developed nations have displayed in regard to the creation of complex algorithmic-based social control and security systems</u>[7.4.2].

It remains to be seen to what degree world powers will entrust Ai systems with the governance of the world, but I argue that, as the century moves forward, **their use will become more prevalent and evident as a consequence of the unfolding of both the new emerging technologies and of the crossroads as a whole.** If we then analyze this likely outcome with the nature of the Ai developmental race Savage, 2020), it is easy to pinpoint what shape those Ai systems will take. Most contemporary high-level Ai research is conducted in isolation, with those researchers that participate in it being so focused on the task at hand that they tend to ignore the potential negative consequences their technologies could have (McWilliams, 2018). If we then compare that fact with the difficulty of creating truly functional emotional and empathetic systems in Artificial Intelligence (Wu, 2019), **we can easily determine that most of the first-generation large-scale administrative Ai systems that will emerge from the ongoing technological race will be functional, but empathically and emotionally void,** a very worrying prospect if we consider that these systems will more than likely be entrusted with administrating the lives of billions of individuals.

Even if we expect that these Ais will become progressively more empathically and emotionally capable as time goes on as a consequence of their machine learning-based nature, **I argue that the prevalence of globalized culture and mass media will significantly disrupt their perception of what human emotions and empathy truly mean.** On top of all of that, if we consider that these systems will be created from the perceptive space of the higher echelons of our contemporary organizational structures, we

should not be surprised if they end up inheriting the perceptive limitations and biases that defined those who created them.

In this context, we also have to account for the granular nature of Artificial Intelligence. While the most significantly impactful consequences of Ai utilization will stem from its usage in governmental structures, **the generalization of simpler forms of automation will also have a very significant effect on the world.** In what concerns the professional world, all seem to point out that automation will progressively overtake most contemporary human jobs from the ones made from simpler merely rational tasks to those composed of more complex tasks that require emotional skills and creativity (Nigel Wright Group, 2018). If we consider everything else that we have discussed in the previous chapters, **we can determine that the advent of professional automation will be highly tumultuous, as it will displace a very significant part of the global human workforce in a relatively short amount of time.**

While we can expect that developed countries might be able to handle such a situation through the implementation of economic reforms such as UBI[7.4.1], the same is likely not going to be the case for developing ones unless a unified global UBI initiative is conducted, for the economies of those nations might not be able to support such a program by themselves as a consequence of either having to utilize most of their resources to develop automated industries or of becoming industrially irrelevant I the international scene as a consequence of not automating said industries.
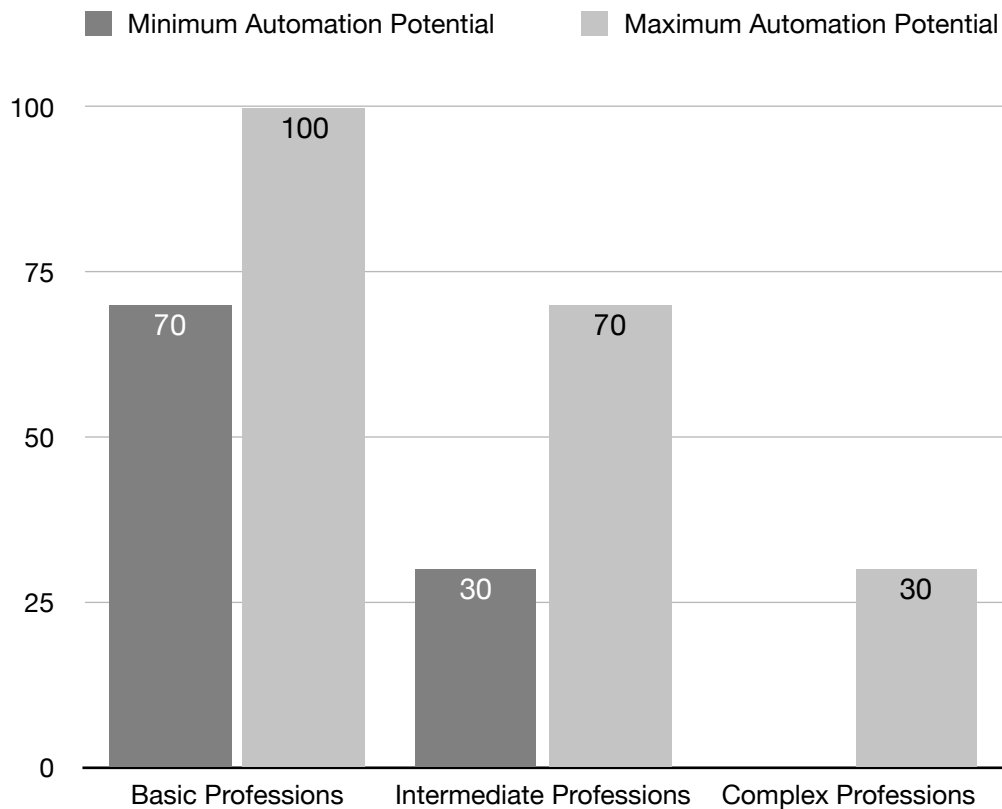
Potential for professional automation by 2050, based on

(Muro, Maxim and Whiton, 2019)

Even then, <u>as already analyzed</u>[7.3.3], **it would be unreasonable to expect that contemporary education and academia would be able to retrain the billions of individuals that will likely become displaced by automation,** and much less help them find a new meaning in the automated world. If we add this factor to the previous one, and we contrast both of them with the biased nature of contemporary Ai systems, we can determine that the advent of automation will more than likely widen the socioeconomic differences between the citizens of developed and developing countries further. This would likely leave most of those living in the former with a purposeless life at best, and those living in the latter with a way weaker economy that can not sustain them anymore one way or another, leading to extreme

amounts of social unrest and conflict to rise worldwide. I argue that this development is comparable to all the previous instances in our history in which we have had to further specialize our industries and population, with the clear difference that, this time, most of the human population will become irrelevant for the contemporary organizational system. Whether our society can overcome this conflict unscathed is a question for which we will have an answer soon enough.

In conclusion to this topic, I argue that what we can expect from the usage of Ai systems as a whole in the coming decades is that, while these systems will help our civilization expand its capabilities and cope with the initial stages of *The Machine at the Crossroads*, **they will ultimately suffer from a perceptive dissonance comparable to that that defined human beings, making them act in ways that will likely be extremely biased and empathically void.** I argue that this top-down approach to Ai development and utilization will only contribute to widening the disconnection that exists between the nature of technology and our own nature, even more, something that would significantly reduce our chances of overcoming the crossroads in an effective way. Conceptualizing how art, culture, and academia could help us tackle this problem from a more sensible standpoint will be one of the key aspects of my postulates.

7.4.7 In Search of Synthetic Gods, Conclusions

●━━━●━━━●━━━●━━━●━━━●▎

In conclusion to this chapter, I will now enumerate what I argue will be the defining characteristics of our world in the foreseeable future, as a consequence of our contemporary organizational and power structures attempting to prepare for The Machine at the Crossroads.

The Upcoming Changes of the World of Tomorrow

- As the challenges posed by the crossroads start to unfold, it is evident that the world will undergo an accelerating adoption of the new emerging technologies as a way to counter them.

- I argue that, unless our artistic, cultural, and academic institutions and disciplines evolve in a way that would permit us to reconcile our tribal nature with the nature of technology before this process progresses substantially, our attempts to use technology to overcome the crossroads will ultimately fail as a consequence of those two natures becoming even more distanced from each other.

- First and foremost, I argue that the advent of the new emerging technologies and the unfolding of the first stages of the crossroads will force world governments to enact Universal Basic Income plans and Universal Surveillance programs in the foreseeable future, as a way to counter the socio-economic disruption and the security risks that would arise from such events.

- It is becoming increasingly evident that the implementation of extensive surveillance systems will be essential if we are to survive the challenges posed by the future. Unfortunately, all seems to point out that, because of the nature of contemporary organizational structures and power groups, these surveillance systems will be extremely invasive and completely algorithmic in nature.

- Similarly, the upcoming worldwide implementation of ecological and sustainability-oriented economic reforms has the potential to further increase social and economic inequality between the different parts of society, and especially between developing and developed nations. The emergence of Geo-engineering technologies could make this problem even worse, as these technologies have the potential to disrupt the climate and biosphere of our planet if they are insensibly utilized.

- The proliferation of General Automaton through the next decades will lead to a world state in which most conventional professions are overtaken by automated systems by the midpoint of the century. Successful worldwide implementation of UBI programs would manage to counter the most significant economic consequences of said process, but will likely not be enough to provide a new meaning to the lives of the billions of individuals that will become professionally displaced. If UBI programs are implemented unequally throughout the world, social inequality will rise drastically between developing and developed nations.

- The unfolding of the Internet of things and Virtual reality technologies will progressively fuse the physical and digital realms into a single seamless

environment. As the large-scale implementation of
these technologies will likely be in the hands of the
same organizations that shaped the social networks,
we can expect that the environments they end up
creating will be structurally similar to those that
define those networks, but will be significantly more
impactful. Consequently, we can expect that the IoT
and Vr environments these organizations will create
will only contribute to aggravating the perceptive
and emotional dissonance that plages contemporary
social networks, which will likely prove to be an
extremely social and cultural challenge on its own.

- The advent of Genetic and Cybernetic Engineering
  technologies will forever change what it means to be
  a human being. The reversal of the aging process
  alone will either create a world state in which most
  individuals can live for hundreds of years with young
  bodies if these medical treatments are distributed
  equally or one in which those who don't have access
  to these treatments relentlessly attack those who do
  if the treatments are not equally distributed. As the
  second scenario would likely lead to a complete
  societal collapse, we can account only for the first
  one. Redefining our culture in regard to those
  scenarios will likely prove to be an extreme
  challenge.

- The generalization of body modification and
  augmentation treatments will lead to a similar
  scenario, with the added complication of the impact
  that globalized culture and authoritarian governments
  could have on human diversity if their influence
  defines whom those technologies are utilized.

- Evidently, as our organizational structures become increasingly less capable of processing the exponentially increasing amounts of information the new emerging technologies will generate, the administration of developed nations and organizations will increasingly be put in the hands of Artificial Intelligence systems. As those systems are likely to be created by a select few individuals from a perceptively and emotionally dissonant position, their administration of the world will more than likely end up being as biased as that of those who created them.

- Taking all those points into consideration, it would be reasonable to expect that in the coming decades the emergence of The Machine at the Crossroads, summed to the more than likely uneven nature of the reforms that will be enacted to attempt to overcome it, will lead to extreme amounts of socio-economic inequality and unrest to rise through the entire world. As it is more than evident that developing countries will have a way harder time against the crossroads than developed ones, we should expect that an extreme amount of conflicts will arise in those nations in the foreseeable future, leading to an unprecedented refugee crisis when the billions of citizens that inhabit those nations attempt to reach developed nations.

It appears that, as it is custom, our civilization will simply attempt to overcome the crossroads by fleeing forward, trusting that technology will permit our organizational structures and behaviors to survive into the next age once again, ignoring, or perhaps choosing to ignore, that this time technology might simply surpass us instead, leaving us behind in the process. There is much more that could be said about the many initiatives that we are currently shaping in an attempt to prepare for the challenges the future will pose, and while I argue that many of them will come short of truly helping us venture into the future, I sincerely hope that they end up making more good than harm.

Nevertheless, independently of what my personal opinions about them might be, I argue that they will play a key role in defining the short-term future of our civilization, and that, consequently, it is essential to consider them as a part of the environment in which to shape my artistic, cultural and academic postulates. After all, as I have previously mentioned, I will pose my postulates in parallel to the initiatives that are already being shaped in the contemporary world, not against them.

8 Postulates
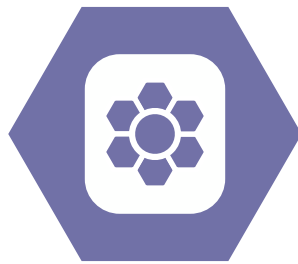
8.0 Introduction to Postulates

This is the last core section of the dissertation and contains a series of chapters in which I elaborate my artistic, academic, and cultural postulates parting from the context and foundation provided by my analysis of the nature of the challenges the future will bring forth, contextualized in ***The Machine at the Crossroads***[7.1], from my analysis of the nature of the human being contextualized in ***Offsprings of Nature***[7.2], and from my evaluation of the current state of contemporary civilization and its readiness towards the crossroads contextualized in ***A Short-Sighted Leviathan***[7.3] and ***In Search of Synthetic Gods***[7.4]. Created within the framework set by the ***Secular Humanistic theories***[6.2] and the rest of my ***chosen theoretical frameworks***[6.0], the main goal of these postulates is not that of conceptualizing how society, art, academia, and culture could be redefined through the coming decades to help us overcome the crossroads, but rather to construct and offer a series of ideas and suggestions that, if sensibly exercised, could help the artistic, academic and cultural disciplines evolve into a form that could potentially help society adapt to and overcome the crossroads.

The first of these postulates is titled ***Art for the World of Tomorrow*** and explores how the artistic disciplines could evolve to help us overcome the challenges posed by the future, giving special attention to the definition and understanding of the artistic mindset as a defining aspect of the human being essential for innovation and capable of partially reconciling our tribal nature with the nature of civilization and technology. This chapter also explores how the role of the artist could adapt to survive against the overwhelming influence of the globalized cultures and emerging technologies, while also posing how said role could evolve further through the next

decades so that artists could help our civilization overcome the crossroads by utilizing the artistic mindset as a force for innovation and a lens that can let us bypass the perceptive dissonance caused by our tribal nature in a case to case basis.

The second of my *postulates, **A Human Academia**, poses how contemporary educational and academic institutions could evolve to better help us overcome the crossroads by incorporating the artistic mindset, the democratic process, and an understanding of our nature and the nature of technology into them, arguing that said institutions could become a foundation capable of helping individuals define and form themselves in a way that is tuned to our tribal nature, the nature of civilization and the nature of technology. In a significant way, this postulate is elaborated as an evolution of the ones made by **The Black Mountain College** of North Carolina.*

*The last postulate, titled In **Search of an Emergent Culture**, will explore how our contemporary informa*tion and communication systems could evolve by mimicking the structures found in naturally occurring evolutive emergent behaviors to help an emergent form of human culture to evolve. This last chapter also explores the possibility of an evolutive human emergence occurring in the context of the crossroads, and how an emergent form of culture could help define such an emergent as a positive entity capable of helping us overcome the crossroads in a way that would let us preserve our human nature. Because of the highly experimental nature of these topics, this last chapter is constructed as a parting point for further research, not as a conclusive postulate.

8.1 Postulate I: Art for the world of tomorrow

With my artistic postulates, I aim to define a foundational framework from which a sensible redefinition of the artistic disciplines can be conducted within the context provided by The Machine at the Crossroads. It is not the objective of this chapter to pose the exact nature of said redefinition, but to instead expose the key characteristics that determine the relationship that is currently forming between the artistic disciplines and the crossroads, so that individual artists might use said information to sensibly redefine contemporary art from the ground up in a sensible manner that is tuned to both the nature of our species and the nature of technology.

What research questions do these postulates address?

- These postulates explore the possible roles that art could take in the context of The machine at the Crossroads and thus address my ***third and fourth core research questions***[3.5.5.3].

- In which ways could art help us make more responsible and equitable use of the new emerging technologies?

- In which ways could art help us face the challenges of the future?

- How could the artistic disciplines adapt to the world of tomorrow sensibly?

- How could we make the cultural, artistic, and academic disciplines and institutions more appealing and accessible to the general population?

What subjects will these postulates explore?

- The definition and understanding of the artistic mindset in the context of the contemporary world and the crossroads, and the underlining of its role as a harmonizer and synergizer between our human nature, the nature of civilization, and the nature of technology as a key aspect of innovation and progress, with the goal of exposing how we could utilize said mindset to help us overcome the crossroads.

- The exploration and evaluation of the currently existing and emerging opportunities available to contemporary artists and artistic agents that could help them avoid being assimilated by the globalized cultures, permitting them to continue their work as artists for the foreseeable future within the context provided by the first stages of the crossroads.

- The analysis of the ways through which the artistic disciplines could adapt to the development and advent of the new emerging technologies, with the goal of

helping artists integrate said technologies into
their work in a sensible way.

- The evaluation of the potential role that the artist
  could develop in society as agents capable of
  bringing the artistic mindset to all other human
  disciplines, aside from their work as professional
  artists, as a way to help our civilization overcome
  the crossroads.

The Artistic Mindset

A defense of the value of the artistic mindset in the context of The Machine at the Crossroads.

Art Against the Crossroads

An evaluation of how the artistic practices and disciplines could adapt to the initial stages of The Machine at the Crossroads.

Art and Technology

An evaluation of how the artistic practices and disciplines could adapt to the New Emerging Technologies.

Artists as Advisors

A defense of the role of artists as interdisciplinary advisors in the context of The Machine at the Crossroads.

Art for the World of Tomorrow
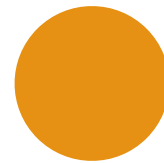
A postulate concerning the future of the artistic practices and disciplines in regard to the next one hundred years.

Art for the world of tomorrow, outline

8.1.1 A key aspect of the human being: *Defining The Artistic Mindset*

I define the artistic mindset as the disposition through which an individual synergizes their perception of reality and their knowledge with their personality through an interpretative and creative process that allows for the encoding of actuality, creates a historical registry, leads to innovation, and helps the individual find a meaning for their existence if it is used to define their actions and interactions with the world. Therefore, I consider the artistic mindset to be a core aspect of all human beings, and one of the main defining characteristics of our sapience level.

I argue that it is through the artistic mindset that individuals can find meaning in their lives, for it permits them to reconcile their own self with what they perceive as reality through a creative process that encodes said perception of reality in a myriad of different ways of variating practicality and complexity depending on the context. For example, I argue that how an individual interacts with the world and how they define their work can be shaped through the artistic mindset so that those two aspects of their lives are fulfilling to them, and that, in doing so, their behavior and professional output would be more natural and innovative.

I also argue that the creative process in itself, defined as the creation of something new from the reinterpretation of what is already known, is an essential aspect of the artistic mindset, but that creativity might also manifest itself aside from the artistic mindset. In this context, I pose that the creative process does not necessarily entail an ontological pursuit, because creative narrow artificial intelligences such as Dall-E 2, which are not sapient, can act creatively (Open Ai Group, 2022). On the other hand, I pose that the exercise of the artistic mindset does entail an ontological pursuit through a creative and imaginative process that is moved by a desire for personal betterment, curiosity, understanding, and personal meaning, and that the exercise of said mindset has been key to foster innovation and progress through our history, as it has encouraged humans not only to understand the universe, but to interact with it and reshape it in ways that make their lives more comfortable, safer, and meaningful. As a consequence, I argue that this mindset has been fundamental to the development and exercise of all human disciplines to a larger or lesser degree aside from the artistic ones.

I pose that every single human being develops the artistic mindset as a part of their growing process as a consequence of it being an essential part of our nature, but that said mindset can develop very differently in different people, depending on the specific characteristics of each individual and on the environmental and social conditions they grow on, with the only exception to this rule being those individuals doted with neural patterns that impede them from developing the aptitudes necessary to form such a mindset in a complete way. Ultimately I argue that all human innovation, including technological development, is rooted in the artistic mindset, but that because the complete pursuit of this mindset is a very demanding and time-consuming task, only societies that are advanced and complex enough to permit some or all of their individuals to

focus on activities aside from subsistence related ones can generate the necessary conditions to foster innovation and progress in a significant way, a process that is exposed by Jared Diamond in his book *Guns, Germs, and Steel: The Fates of Human Societies,* and more precisely on the chapters dedicated to exploring the rise of the first human civilizations (Diamond, 1999,p. 85–239)[10.3.1.18].

Therefore I argue that while most human beings do develop and exercise the artistic mindset in one way or another, environmental, social, and economic conditions have allowed only a small number of individuals to pursue said mindset in a significant way throughout our history. As *Buckminster Fuller* explored in his book *Operating Manual for Spaceship Earth* (Fuller, 1969), said exercises of the artistic mindset have more often than not been confined to very specialized social roles, such as the artistic, scientific, philosophical or theological ones. As Fuller poses, the continued specialization of society, while necessary to cope with the increasing levels of information generated by technological and social progress, caused our civilization to grow increasingly less capable of adapting to change and unforeseen events. At least in part, I attribute this development to the dilution and marginalization of the artistic mindset as a consequence of the continued specialization of society and the marginalization of the creative disciplines In favor of the technical ones.

Very relevantly, history exposes that in those moments in which social conditions permitted individuals to exercise the artistic mindset meaningfully, society, technology, and culture progressed way more significantly than in those moments in which they didn't, especially if those conditions allowed individuals to exercise said mindset in interdisciplinary ways, the main examples of this being the emergence of ancient greek philosophy, the Italian Renaissance, the Enlightenment (Flew, 2010), and the advent of the modern era at the beginning of the

20th century, as the rise and work of the *Bauhaus* (Invaluable, 2019) and the *Black Mountain College* (Keough, 2013) exemplify.

However, I argue that the exercise of the artistic mindset doesn't necessarily need to be a positive thing, as an insensible use of it can be disruptive, detrimental, or even dangerous to individuals and societies. As the studies conducted by *The Black Mountain College* (Keough, 2013) and the art critic *Hal Foster* (Foster, 2015) reveal, an individual needs to be sensibly educated in tune with their personality, the nature of our species and the nature of technology, in order to be able to think and act responsibly and in a critically-minded manner. Such behavior allows the individual to perceive actuality in a non-disrupted way, which then allows them to exercise the artistic mindset sensibly. Consequently, it is evident that if we are to foster a more sensible use of said mindset, contemporary education will have to redefine itself in tune with these postulates in one way or another.

Nevertheless, I argue that the defining characteristics of the artistic mindset, when compared to Fuller's commentary on the nature of hierarchical power and its preference for the maintenance of the status quo (Fuller, 1969, p. 13), expose why the merely practical and doctrinal disciplines have been more favored through the history of civilization than the artistic and creative ones, as those in power likely perceived that if they had left the artistic mindset be pursued beyond the scientific and cultural disciplines constructed around practicality, the status quo would have been put into question way more frequently, as the citizens they governed upon would have become way more innovative and disruptive, that last part is a consequence of the proliferation of the artistic mindset in a society incapable of supporting the sensible education of all of its inhabitants.

The fates of the aforementioned *Bauhaus* (Invaluable, 2019) and *Black Mountain College* (Keough, 2013) serve as examples of what happens when the state of the world doesn't allow for the artistic mindset to develop beyond a confined set of practical disciplines. However, I argue that, theoretically, advanced automation could allow contemporary societies to create an environment in which all individuals could fully exercise the artistic mindset.

I argue that this also explains why the artistic mindset has generally been confused with the creative process throughout our history, as those practical disciplines that do need curiosity and innovation, such as the natural sciences and engineering, do not necessarily require the individually driven ontological perception and encoding of actuality that defines the artistic mindset to be of use to society. As I previously posed, the creative process can be exercised aside from the artistic mindset, but I argue that doing so generates results that are not necessarily in tune with actuality, for they are perceptively and emotionally distant in regards to both the environment they have been created in and towards the individuals that created them, an aspect that clearly defines most contemporary research groups, for better or worse (McWilliams, 2018).

I also argue that the artistic mindset is also a clear aspect of our tribal nature and mind, as archeological studies have revealed that it was present in the earliest instances of our species that we have records of (The Guardian, 2021). Therefore, this makes evident that such a mindset can not help us to overcome the limitations of our tribal mind, but it allows us to make the best of our strengths: if exercised in a responsible and perceptively critical way, the artistic mindset permits individuals to conduct a sensible interpretation and creative reinterpretation of actuality that is tuned to their way of being, leading to innovation and self-fulfillment, and

creating an extremely valuable historical registry of the moment said interpretation of actuality was conducted.

When compared to the analysis conducted by *Jared Diamond* about the evolution of the different human civilizations (Diamond, 1999)[10.3.1.18], this also helps explain why those societies that ran out of resources to innovate because of environmental conditions, exemplified by the many Paleolithic cultures that didn't have the agrarian resources necessary to create complex civilizations, or that became unchallenged because they managed to culturally unify their surrounding territories, exemplified by the fate of the ancient Chinese empire, suffered from severe innovative and cultural stagnations, and that those regions that had culturally diverse, tumultuous, yet stable enough spaces allowed for innovation and progress to emerge way more consistently, as exemplified by the Mediterranean region. This reveals that, for the artistic mindset to be exercised, the individual needs to have enough resources to exercise it, and enough challenges to drive his desire for understanding, fulfillment, and innovation.

To conclude this analysis, let's enumerate the main defining characteristics of the artistic mindset.

What are the defining characteristics of the artistic mindset?

- It is universal to all human beings and expresses differently depending on the nature of each individual and the environment said individual inhabits.

- It has been a defining characteristic of the human being since the beginnings of our species and is thus linked to our tribal nature.

- It is an expression of the self, as it attempts to discover and understand reality through an analytical and creative process that allows the individual to encode said perception of actuality in an innovative, fulfilling, and beneficial way.

- Therefore, the artistic mindset stems from curiosity, creativity, and individuality and leads to innovation and self-fulfillment.

- As it is linked to our tribal nature, it allows the individual to interpret and understand reality in a way that is relevant and fulfilling to themselves. If said interpretation is also made in a critical and responsible manner, actuality is perceived in a significantly less biased way than if it was not conducted from an artistic standpoint, as it synergizes the emotional and rational aspects of the individual.

- It is not necessary for the exercise of the creative process, but it allows it to be conducted in a more sensible way that is more tuned to our nature. If a critical, artistic, and responsible approach is taken to interpret reality, innovation can be conducted in a way that is relevant, fulfilling, and beneficial to both the individual and society.

- If the artistic mindset is exercised without a critical and responsible aptitude, its innovative and creative results can be detrimental to both the individual and society.

- It has been essential for the progress of human civilization, with our most significant cultural, scientific, and ontological achievements stemming from it.

- It is excitedly hard to allow it to be undertaken by all society, as that would require universal sensible education and baseline resource provision. Advanced automation might be capable of solving this problem.

What does the artistic mindset require to be exercised sensibly?

- It requires the individual who exercises it to be sensibly educated and trained in a way that is tuned to their personality, the nature of our species, and the nature of technology. Such an education, if properly conducted, allows the individual to develop an individualistic, perceptively critical, responsible, and respectful mindset towards others, which permits them to perceive actuality in a non-disrupted manner, an essential requirement for the sensible utilization of the artistic mindset.

- It requires the continued exercise of critical thought.

- It requires the development of curiosity and creative skills.

- It requires a culturally diverse environment, for a culturally homogeneous environment curtains the perception and interpretation of actuality from an individualist standpoint.

- It requires an environment that allows the individual to exercise the artistic mindset without compromises aside from those set by common sense.

- It requires the environment to provide the essential resources and tools necessary to sustain the

individual and to allow them to exercise the artistic
mindset.

- It also requires for an environment that presents the
individual with challenges to overcome through the
exercise of the mindset, as a complacent or
conformist life doesn't generate enough stimuli to
lead the individual to act meaningfully.

Self-fulfillment

Innovation

Creation

The Artistic Mindset

Curiosity

Creativity

Critical Thought

The Perception of the World
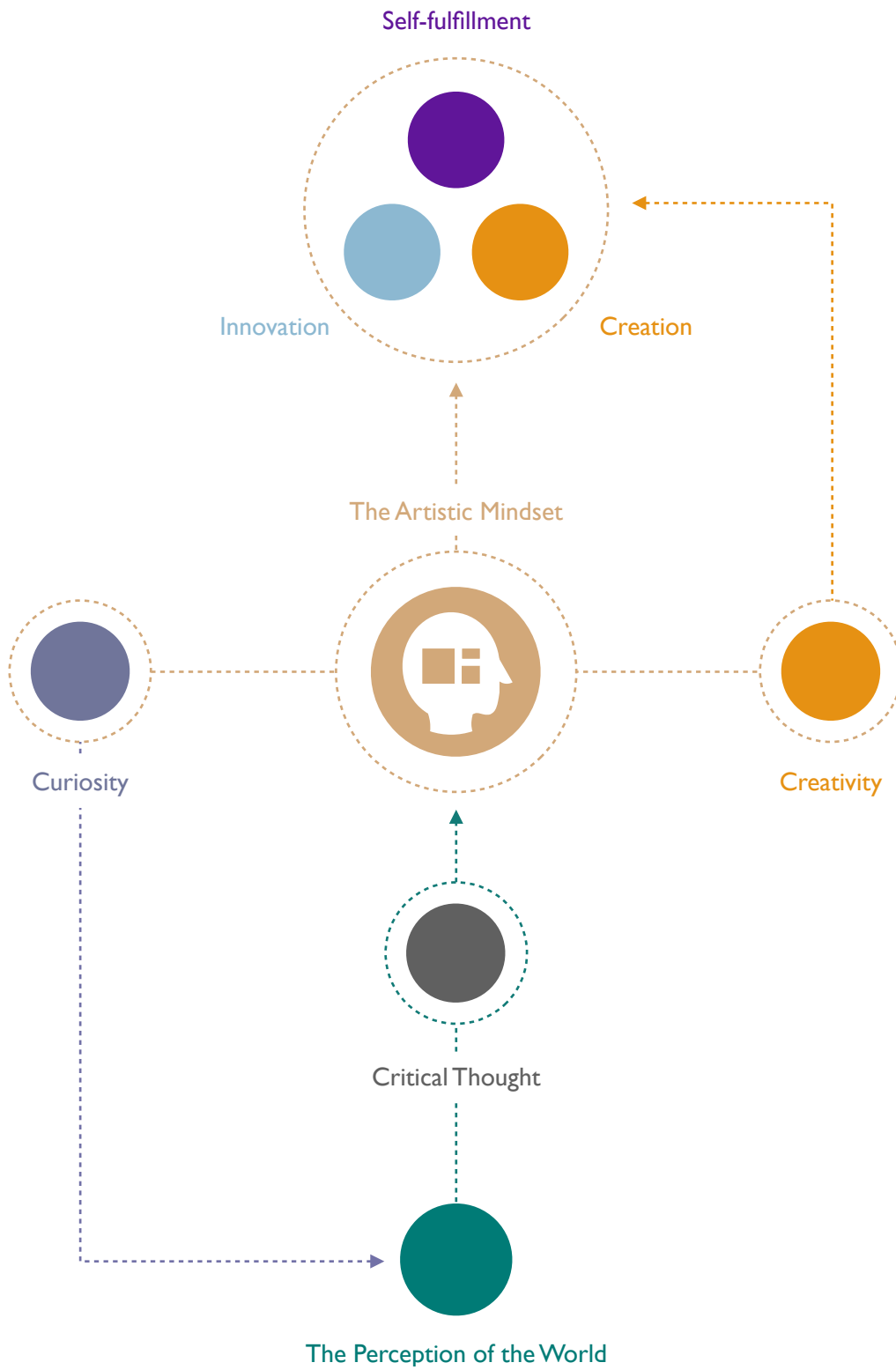
The artistic mindset, diagram

In the context provided by this definition of the artistic mindset, I identify the artist as the individual who makes the pursuit of the artistic mindset on itself, and especially the encoding of reality through a creative process that generates a symbol as a form of ontological search, the center-point of their life, instead of said mindset being just a core aspect of it. As the nature of the individual determines the artistic mindset, artists tend to be extremely diverse in what concerns their abilities and work, and because of this, they can end up interacting with, or even becoming a part of, any human discipline, which, as the renaissance demonstrated, is of special relevance in regards to the scientific and technical disciplines.

Unfortunately, throughout the history of our species artists have not been able to fully dedicate themselves to the pursuit of the artistic mindset, as they have been forced to perform other activities to sustain themselves, but I pose that, in a grand part, it has been artists who have safeguarded this mindset since the advent of civilization through the conduction of their work. This is a role that could be essential in the context of *The Machine at the Crossroads*.

I base my definition of the artistic mindset, its relation to the creative and ontological processes, and its relevance for innovation and progress on the theories posed by the Secular Humanistic Philosophy in what concerns the nature of the human being and the relevance of creativity as an ontological process (CSU, 1980), on the definition of the relation between art and technology posed by the Bauhaus (Invaluable, 2019)[10.4.2.7], on the analysis of the evolution of hierarchical power structures and education made by Buckminster Fuller (Fuller, 1969), on the definition of an academic model based on the artistic mindset posed by The Black Mountain College (Keough, 2013), and on the analysis on contemporary art made by Hal Foster (Foster, 2015).

In conclusion, **I pose that the artistic mindset is not only an essential aspect of the human being as it allows us to find meaning in life by questioning and reinterpreting our perception of reality through a creative process, but that said mindset is the main fosterer of social, cultural, and technological innovation.** I argue that in the context of *The Machine at the crossroads,* it will finally be possible to foster this mindset throughout the entirety of society, as the advancements in automation and communication technologies could allow us to become free of having to perform menial tasks and professions, while also providing us with the tools necessary to create an all-encompassing sensible form of education and academia and a sensible form of cultural network that is truly diverse and tuned to our nature. Ultimately, I argue that the sensible nurturing and propagation of the artistic mindset will be key in helping individuals find meaning for their lives in the world of tomorrow, and that said development could be of considerable help when facing the crossroads, as it would significantly increase the sense actuality, responsibility and innovative potential of our species.

8.1.2 Weathering the storm: *Contemporary Art and the Initial Stages of The Machine at the Crossroads*
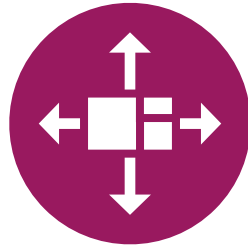
There is much that can be said about what beneficial roles artists could play in the context of *The Machine at the Crossroads*, but we first have to account for the growing and encroaching influence of the globalized cultures, and how said influence disrupts the artistic disciplines and the work of artists both in direct and indirect ways.

This one is a topic that I have explored in deep in the chapters dedicated to analyzing **the nature of the contemporary globalized cultures**[7.3.5], and **the nature of the contemporary mainstream artistic world**[7.3.4], an analysis that I conducted in tune with *Hal Foster's* commentaries on the current state of contemporary art in the context created by the globalized cultures, as explained in his book *Bad New Days Art, Criticism, Emergency* (Foster, 2015, p. 140-155). From these studies, we can conclude that, on the one hand, there is simply nothing that contemporary artists can do to have a significant impact on contemporary society as a consequence of the prevalence of globalized cultures disrupting the perception, critical thought and emotions of most individuals, and on the other that it is increasingly hard for artists to work outside the boundaries set by globalized cultures, with the influence of the social

networks being of extreme relevance in that regard, as a consequence of the contemporary art market becoming increasingly more defined by speculative investors (Levy, 2019).

As I have already explained in the previous chapters of this dissertation, I argue that this is a scenario that could eventually lead to the almost complete assimilation of the artistic disciplines, agents, and institutions by the globalized cultures and speculative markets, rendering artists and their artworks as mere commodities to be speculated with, and diluting the artistic institutions until they are nothing more than shop displays, tourist attractions or propagators of the predominant globalized cultural dogma. Evidently, many artists and cultural agents are attempting to resist the influence of globalized cultures, but it is increasingly evident that this is a losing battle. Nevertheless, as the nature of *The Machine at the Crossroads* determines that the globalized culture and unsustainable economic models are bound to progressively become less capable of sustaining themselves, I argue that the artistic disciplines are bound to be liberated from their influence sooner or later, but I also argue that if said liberation comes too late or develops in a way that is deprived of a sufficient foundation to rebuild upon, these disciplines would likely take too long to reform to be of significant help against the crossroads, a luxury we cannot afford.

This is why I pose, in tune with *Hal Foster's* postulates in praise of actuality (Foster, 2015, p. 140-155), that the most sensible thing that independent thinking artists and cultural agents could do to weather the current globalized culture storm is to adopt a form of work that is in tune with both their own self and the essence of the artistic mindset, as a form of cultural resistance and as a preparation for the moment in which the globalized cultures start to collapse, so that when the said moment arrives the artistic disciplines can be reborn anew way quicker and way more sensibly and effectively than if they did

otherwise. I construct these postulates taking my definition of the artistic mindset as a basis, and therefore create them from a humanist standpoint.

Art in defense of actuality, art as individual resistance

- This form of art would imply a return to the essence of the artistic mindset, as defined in the previous chapter of this dissertation. Therefore, it would require that artists would conduct their work as a way to codify their perception of actuality into a symbol through a creative and innovative process. This would allow artists to perceive actuality sensibly, which would permit them to find meaning in their lives through the conduction of their work.

- For this art form to be sensible and effective, the artists would have to fulfill a series of requirements and develop a series of skills: those defined by Hal Foster in his praise of actuality (Foster, 2015, p. 140-155).

- First and foremost, the artist would have to adopt the artistic mindset not only as a way to define their creative work, but also as a disposition towards life. If done sensibly and with responsibility, this would allow them to synergize the rational and emotional aspects of their mind, permitting them to develop their skills, conduct their work and live their life in a more sensible way that is tuned to both their way of being and the nature of the world they inhabit, an essential requirement for the sensible exercise of the artistic mindset. This is what I define as Cognitive Synergy.

- As a subject of the first point, the artist would have to develop a critical and sensible way of

perceiving reality and themselves regarding the past, present, and probable future. Only such a mindset would allow the individual to perceive actuality sensibly, even if said perception remained subjective. In this regard, I argue that adopting the artistic mindset as a way to define one's life would be essential. I define this aspect as Perceptive Criticality.

- Then, the artist would have to use said critical perception to properly evaluate and tune with their own personality and emotions separating themselves from the personalities of other individuals. Afterward, the artists would have to pair said perception with the development of a series of creative skills to hone a personal and unique artistic style that would not necessarily be based on the work conducted by other artists. This aspect is called Personal Aesthetic.

- Lastly, with this set of skills and characteristics developed, the artists would be able to create artworks defined by the artistic mindset in ways that would encode the artist's perception of actuality into a symbol through a creative process, giving birth to artworks that would help their creator perceive and understand actuality and find a meaning for their life, while also serving as historical pieces that would preserve the history of the world as it was when they were created, as understood by the artist who created them.

- This process would allow the artist to sensibly perceive actuality and develop their own self in relation to the environment they inhabit through the exercise of the artistic mindset, creating artworks

that encode this development as a consequence. In turn, these artworks would serve as a way to codify the moment and context that defined their creation.

- To this end, the artist would have to understand that, while it would be possible to criticize parts of society through their work, said critique would more than likely be unable to provoke a sensible and positive reaction from those that perceive or interact with it, as a consequence of the influence of the globalized cultures. Consequently, the artists would have to conduct their work and life in an intimate way that is aware of the state of society, but that recognizes that there is little that can be done to change from an artistic standpoint until the globalized cultures begin to fade away.

- Ultimately, this process would allow the artists to resist the influence of the globalized cultures, their work serving as a form of seed from which a more impactful form of art could emerge when the necessary conditions are fulfilled.

- However, as the contemporary art markets are increasingly being defined by the influence of globalized cultures and speculative investors, artists would have no option but to undertake secondary professional ventures if they are to sustain themselves economically, especially if they decide to not partake in the artistic rat race that the contemporary art markets are becoming. This sad truth would only get solved when a Universal Basic Income system is implemented in the environments the artists inhabit, as such a system would allow them to conduct their work independently of the sphere of the contemporary art markets.

- This situation is comparable to how artists have defined a significant part of their work through the history of civilization, as usually, they have had no choice but to adapt to the social, economic, and cultural environments that defined their time, with only significant technological and social milestones and changes allowing them to become autonomous from the demands of society, at least until society reconfigured itself again into a form tuned to hierarchical power structures.

- This is why I argue that only the advancements and challenges the new emerging technologies will bring forth will allow the contemporary artist to grow independent from the influence of globalized culture and the contemporary art markets, similar to those other events throughout the history of our species in which a technological development lead to the emancipation of artists, the most relevant recent case being the emergence of Impressionism as a consequence of photography and cinema overtaking the role of capturing reality.

- I argue that whether if the emergence of *The machine at the Crossroads* will allow artists to become permanently independent from having to adapt their work to the demands of society or not will likely be determined by how sensibly we manage to overcome it, a topic I'll explore further through these postulates.

The Artistic Process

Through the sensible exercise of the artistic process, actuality is encoded, and the artistic mindset preserved.

The sensible exercise of the artistic mindset provides self-fulfillment

The Artistic Mindset

The artistic and critical mindsets are used to become tuned with one's personality sensibly.

The elaboration of a personal creative stile that is tuned to one's personality.

Adopted both towards the perception of the-world and the self.

Art in defense of actuality, diagram

This analysis resumes what I consider would be a sensible way for artists to conduct their work sensibly in the present day, in preparation for the first stages of The Machine at the Crossroads, yet there are some aspects that I consider are important to mention in this regard. Above all, I recognize that, while these postulates are formulated from a humanist standpoint with the intention of being relevant to the entire world, they are only truly applicable in those areas of the world that are under the influence of western globalized culture, as those artists that inhabit parts of the world that are defined by the eastern globalized culture, or that are to become defined by said culture in the foreseeable future, will more than likely be unable to adopt them in a significant way as a consequence of the extreme censorship said form of culture would impose over individualistic or nonconformist attitudes. Being someone who has not been part of society defined by this type of culture, I can not sensibly determine how these postulates could be adapted to those environments, but I encourage those who have lived in them, and that are tuned to the intention of my work, to research further.

I also recognize that because of the economic differences between the different nations that compose the world, those artists that inhabit developed nations will have a way better time adopting these postulates and conducting their work than those who inhabit developing countries, especially considering that UBI systems are very likely to be implemented earlier in developed countries than in developing ones. However, this is a problem that scapes the focus of this postulate, as it would only be solvable by those regions of the world becoming fully developed. However, as I will explore with my academic and cultural postulates, I argue that the proliferation of the artistic mindset in these territories through art, academia, and culture would contribute to their development.

Now well, in what concerns the behaviors and roles that the art institutions and the cultural agents could adopt in the first stages of the crossroads, I argue that, based on my analysis of the state of the contemporary art world as exposed in <u>the literature review</u>[5.5.2.1] and in *A Mute Uproar*[7.3.4], we can conclude that their options might be way more limited than those available to artists, for these institutions and individuals are considerably more dependent on complying with the whims and trends that define the globalized culture and global economic markets in order to remain functional. Even then, I argue that there is still much that these organizations and agents could do, even on a reduced scale, as long as they work in tune with independent-thinking artists, but I believe that it would not be sensible for me to define such actions in a specific level, as I recognize that such an act would entail a value of judgment, and therefore can only pose my ideas about them as ope-ended recommendations.

Recommendations for the artistic institutions

- I recommend those artistic institutions and agents whose traditional roles have been the recollection, preservation, and exhibition of contemporary and historic artworks and cultural pieces too, whenever possible, conduct their work in a sensible manner that is critically minded, and that recognizes the importance of maintaining the historicity and cultural value of those artworks in an unbiased way that is separated from the influence of the social networks and the globalized cultures.

- I recommend the art institutions and agents to, whenever possible, incorporate critically minded artists into their developmental process, as they can help them conduct their work in a way more sensible

manner that is way more perceptive of actuality and
that is tuned to the nature of art and culture.

- I recommend those artistic institutions and cultural
  agents whose role is that of assisting artists with
  exhibiting and marketing their artworks to, whenever
  possible, attempt to provide spaces and environments
  that would allow artists to exhibit and market their
  work outside of the spaces defined by the social
  networks and the globalized cultures.

As I previously argued, I don't think that there is much
that sensible artists and cultural agents can do nowadays to
overcome the influence of globalized cultures and the
speculative markets, but it would be reasonable to expect that,
once the opportunities and challenges posed by the crossroads,
and especially the new emerging technologies, start to unfold in
the coming decades, the globalized cultures and the
unsustainable economic practices will be weakened enough for a
sensible redefinition of art and the artistic disciplines to be
conducted.

This is why I pose that those artists and cultural agents
that are critically minded enough to be aware of this situation
should collaborate with each other to, at the very minimum,
preserve the core values of the artistic disciplines and the
historicity of the artworks created in previous eras, so that
when the globalized cultures and speculative markets get
weakened enough, art can be redefined in a more sensible way
that is tuned to the nature of The Machine at the Crossroads. I
pose that this process would have to be accomplished in parallel
to a sensible redefinition of academia and education, as I argue
that only such a development would allow the general population
to become critically minded and responsible, a topic I'll
explore in detail through my academic postulates.

8.1.3 Searching for a new Bauhaus: *Art and the New Emerging Technologies*

To say that the new emerging technologies will play a key role in defining the foreseeable future would be a monumental understatement, and this is a topic that I explored in deep both in the <u>literature review</u>[5.1] and in the chapter dedicated to analyzing <u>the nature of The Machine at the Crossroads</u>[7.1.2]. As a consequence, it is evident that these technologies will more than likely have a very significant influence on the definition of the artistic disciplines for the foreseeable future, both in direct and indirect ways, both for better and for worse.

Art and technology have always had a very intricate and intertwined relationship, with the artistic mindset being fundamental in fostering the curiosity and innovation that leads to scientific and technological evolution, and with technological evolution allowing artists to better understand and encode actuality through a creative process. More often than not, artists and artistically inclined individuals have played a fundamental role in the development of innovative technologies, while at the same time technological development has allowed or forced artists to embrace the artistic mindset more intimately and effectively as a consequence of said technological

development opening up new creative venues and shaking up the structure of society.

The history of our species is filled with events where this relation between art and technology manifested and proved to be key for the advancement of civilization, the most significant recent examples being the renaissance age, the enlightenment, and the advent of the XXth century, but a more broad analysis of our history, and of the history of the artistic disciplines, reveals that this is a pattern that has been present since the origins of the human civilization, as explained in the recent study conducted on the topic by the European Parliamentary Research Service (EPRS, 2019). However, we also have to account for the very real possibility of technology overwhelming the artistic disciplines, or even of it overwhelming our species as a whole, as a consequence of the accelerating nature of technological development, a challenge I posed In my analysis of <u>The Machine at the Crossroads</u>[7.1.2].

In essence, I argue the current situation of the art world in relation to technology is comparable to the one the artists of the beginning of the XXth century faced, with them being recently and forcibly emancipated from having to represent reality as a consequence of the emergence of photography and cinema and afraid of technology making them completely redundant in the face of society at large. It was this sentiment that pushed *Walter Gropius* to found the Bauhaus (Winton, 2016), giving birth to an art school and workshop that not only reaffirmed the artistic mindset and technological innovation as two sides o the same coin, but that allowed the artists of its time to shape a very successful artistic movement that bridged form, function, and innovation (Jiehong, 2021). Consequently, I pose that it would be sensible for contemporary artists to give shape to a new artistic movement tuned to the spirit of the Bauhaus and that of The Machine at the Crossroads.

Despite the similarities, I argue that there are three main differences between the environment in which the Bauhaus was created and ours. **First, we have to consider the extremely impactful nature of the emerging technologies themselves**, each one of them being capable of completely redefining our civilization and species, each one of them being capable of offering a plethora of new creative opportunities as well as being capable of overwhelming those who don't manage to understand and use them sensibly as a consequence of those technologies redefining both the world and our very species. **Second, we have to account for the complex and dangerous nature of the crossroads itself**, which will likely cause an unprecedented escalation of social upheavals and crises. **Third, we have to account for the more than likely possibility of the new emerging technologies irremediably making our contemporary economic models obsolete**, which might help artists become permanently emancipated from the whims of the economic markets, as long as proper economic reforms, such as the implementation of UBI plans, are conducted to counter said eventualities.

In regards to that third point, it is significant to mention that so far in the history of our civilization artists have always had to adapt their work to the social, political, and economic demands of the environments they have inhabited, as only by doing so have they been able to become economically sustainable individuals. It is evident that significant technological and cultural milestones, and the subsequent social and organizational upheavals they generate as defined by Buckminster Fuller (Fuller, 1969), tend to allow artists to temporarily grow independent from the demands of society and conduct their work in tune with the <u>artistic mindset</u>[8.1.1], but those events, while very impactful, have so far been unable to prevent artists from becoming dependent on complying with the demands of society again after a variable amount of time has passed, as the societies those artists inhabited eventually

adapted themselves to the usage of said technologies without having to abandon the hierarchical specialized organization. However, if we consider the nature of _The Machine at the Crossroads_[7.1], we can determine that that might not be the case for what concerns the advent of the new emerging technologies, for they have the potential to make our contemporary social and organizational structures obsolete permanently.

I argue that this is a never seen scenario that might allow artists to become permanently independent from the whims of the society they inhabit, if they so desire, both in a cultural and economic sense, a very significant difference from the scenario in which the Bauhaus was created. However, much as it is the case for society itself, if the emergence of these new technologies is not handled sensibly by artists, they risk being overwhelmed and overtaken by them, simply because the world will become too defined by these technologies for artists to continue to exercise the artistic mindset sensibly if they do not learn to understand and utilize these technologies with reason, empathy, and responsibility, with the entirety of the artistic disciplines, also being endangered as a consequence.

In that regard, I argue that the emergence of Artificial Intelligence based creative systems, such as the Dall-E2 algorithm, have the potential to alienate artists the most, as they would undoubtedly take over creative commercial ventures, which is one of the most significant revenue streams available to contemporary artists (Open Ai Group, 2022). It is ultimately in this context that I argue that a new form of Bauhaus should be conceived, but **I also argue that such an organization could only be conceived sensibly by a sizable part of the artistic community, and only when The Machine at the Crossroads becomes evident to them.** I also argue that **any redefinition of the artistic institutions in regard to the world of tomorrow would have to emerge in a similar manner,** as any attempt to redefine them beforehand or in isolation would be bound to the same

biases and limitations as the artistic community as a whole. Therefore, I will abstain from exploring that topic further.

However, I argue that it would be sensible for me to pose, based on my understanding of the matters at hand, a series of recommendations for contemporary artists to follow so that they might better understand and interact with the new emerging technologies within the context of the crossroads, recommendations posed in parallel to the ones I offered in regards to overcoming the influence of the globalized cultures and the speculative markets[8.1.2].

I argue that there are three behaviors artists could exercise to approach the advent of the new emerging technologies in a sensible manner, both in regards to their development and utilization: **to study and understand the nature of these technologies sensibly and in a deep manner so that they might utilize them responsibly,** independently of the use they might make of them, **to study, understand and utilize the automation and artificial intelligence technologies as a part of the creative process,** and **to participate in the development of the emerging technologies by becoming consultants of the research groups that develop them.** Needless to say, I argue that these behaviors would only be effective in helping artists sensibly adapt to the emergence of these technologies if a sensible redefinition of academia and education is conducted in the foreseeable future, a topic I'll explore in the next chapter of this dissertation.

The understanding of the New Emerging Technologies

- I pose that it is essential that artists learn how to understand and utilize the New Emerging Technologies in a critically-mindful and sensible manner.

- I argue that this understanding of the emerging technologies will be necessary for artists to sensibly perceive the world of tomorrow, as this world will be defined by these technologies in a very significant way.

- As the proper exercise of the artistic mindset requires a sensible perception of actuality, it would be impossible for artists to exercise such a mindset in the future without having an understanding of the new emerging technologies. Consequently, I argue that artists should study the nature of these technologies regardless of whether they choose to utilize them in their creative processes.

- I argue that if artists were not to manage to understand and utilize these technologies in a sensible manner, they would ultimately become overwhelmed and overtaken by them. However, I also argue that such an understanding would not be enough to prevent that outcome just by itself, as the complete avoidance of that scenario would require the reconciliation of the individual with their tribal nature and the nature of technology.

- Evidently, such an understanding of The New Emerging Technologies would only be possible through a sensible academic process that is tuned to the nature of The Machine at the Crossroads.

Art and Artificial Intelligence systems

- I pose that, from all the emerging technologies, artists should study, understand and learn to sensibly utilize Artificial Intelligence based systems and tools the most, for these technologies

will be key in defining the productive patterns and expectations of the world of tomorrow.

- Ai-based tools will allow artists to exponentially increase their creative potential and productive capacity, permitting a single artist, or a small group of them, to create artworks that nowadays would require the combined efforts of hundreds or even thousands of individuals to accomplish.

- I argue that most artists would eventually embrace the use of these technologies willingly, or would be forced to do so at the risk of becoming overshadowed by those who do. While I would like to believe that there would still be environments for those artists who reject the usage of these technologies to conduct their work and be recognized for it, I argue that the nature of the crossroads will eventually force them out of them unless society as a whole learns to utilize the new emerging technologies sensibly.

- I argue that this eventuality becomes way clearer if we consider that Ai systems, because of their machine-learning-based nature, will theoretically be capable of mimicking the creative process and personal aesthetic of any artists, which will more than likely cause a significant regulation of the field which could end up displacing those artists that choose not to use those systems. At the bare minimum, I pose that all artists will have to encode their personal aesthetic and creative patterns into an Ai system as a way to protect their artistic identity, independently of the usage they make of those Ai systems afterward.

- Nevertheless, as the artistic process generates an intangible value, I argue that Narrow Artificial

Intelligence systems will never be able to overtake the artistic disciplines, as those systems not being sapient beings, will not be able to generate said value on their own.

- However, in the case of the non strictly artistic creative professions, such as designing and conceptual art creation, this might not be the case. As these professions do not generate nor require an intangible artistic value, I argue that creative Ai systems could eventually overtake them completely. As proved by programs such as *Dall.E 2*, which can create complex and believable concept artworks from simple text descriptions of what one wants a concept of (Open Ai Group, 2022), this eventuality might become a reality sooner than expected, potentially displacing those who occupy those professions in the immediate future.

- Having said all this, we now have to recognize that as these technologies are extremely complex in nature, it would unreasonable to expect that artists would be able to fully understand all their inner workings, but I pose that it would be essential for them to understand them enough to not be significantly disrupted by the biases that will define these tools as a consequence of their artificial nature.

- Ideally, I pose that it would be preferable that artists would learn Ai system programming up to a point that would allow them to create their own Ai-based creative tools, but I recognize that this would not be achievable for most artists unless a sensible set of Ai creating tools were created and released to the general population.

- Ultimately, I argue that for artists, or for any other type of individual, to learn to sensible understand and utilize Ai-based systems it would be necessary to conduct a sensible redefinition of the academic and educational institutions that, in tune with the nature of *The Machine at the Crossroads* would incorporate the understanding, creation, and utilization of Ai systems and tools as one of its core aspects. This is a topic I'll explore in detail in my academic propositions.

- In what concerns the potential impact that fully sapient Artificial General Intelligences could have in the art world, I argue that it would be sensible to expect that such beings would be able to become independent artists on their own if they choose to do so and that it would be sensible to treat them as such. However, at this point, we can only speculate about what type of artworks they would create, but I argue that they would likely make extensive use of simpler forms of AI in their creative processes. Therefore, this reinforces the fact that, for contemporary artists not to be overcome by the emerging technologies, it will be key that they study and understand them up to a point that allows them to utilize these technologies in a sensible manner.

Art and Augmented Reality

- My argument in favor of artists studying, understanding, and learning to utilize the new emerging technologies sensibly is of special relevance in regards to the emergence of Augmented Reality technologies (Marr, 2021), for these technologies will more than likely radically alter

how individuals perceive and interact with the world, two defining aspects of the exercising of the <u>artistic mindset</u>[8.1.1].

- I also argue that Augmented reality will open a very interesting new arts venue, for it will allow artists to extrapolate their own perception of actuality into the perception of the world itself in an unprecedented manner. These technologies will also allow artists to seamlessly blend the digital realms, and their perception of them, with reality, which also opens many new creative opportunities.

- However, I argue that, unless artists manage to understand and utilize these technologies sensibly in tune with the artistic mindset and away from the influence of the globalized cultures and the globalized markets, their perception of actuality will become so distorted that their exercise of the artistic mindset would be severely compromised (Marr, 2021).

Art and Virtual Reality

- I argue that the large-scale emergence of virtual reality will radically alter the artistic landscape, for it will permit the creation and exploration of extremely complex and fully immersive virtual worlds (Eisenberg, 2018).

- As the creative ventures that would derivate from the usage of said technology would likely be extremely diverse, it is not feasible to imagine the shape of those realities.

- What I argue is that, unless artists manage to understand and learn to utilize these technologies

502

sensibly, they might become completely entrapped by the virtual realms, for the opportunities these realities will offer in regards to satisfying one's curiosity and personal desires, summed to their potential use for creative proposes, will be too enticing for artists to escape from them.

- While this problem will likely affect every type of individual, I argue that it will affect artists the most, as a consequence of their tune with the artistic mindset[8.1.1].

Art and body modification and augmentation technologies

- Similarly, as it is with the case of Artificial Intelligence, I pose that artists will likely have no choice but to study and understand the body modification and augmentation technologies that will define the world of tomorrow, at risk of becoming overtaken by them otherwise, but for different reasons (Alston, 2020), (Carey, 2020).

- These technologies will offer the possibility to modify and enhance our own bodies through genetic and cybernetic engineering, which apart from allowing artists to expand their creative capabilities through the enhancement of their body and intellect, will also allow them to conduct their work through the modification of their body in unprecedented manners.

- However, I pose that, unless these processes are conducted in a sensible and responsible manner that is well aware of actuality and lets itself not be defined by the influence of the globalized cultures and speculative markets, their outcomes are likely to

be extremely biased in favor of said globalized
cultures and speculative markets, which could have
extremely detrimental consequences for those artists
that partake in them.

- Ultimately, I argue that only a sensible redefinition
  of The artistic disciplines conducted in parallel to
  a sensible redefinition of academia and education
  conducted in tune with our nature, the nature of
  technology, and the nature of the crossroads would
  prevent this scenario from becoming a reality.

The artist as a researcher

- I pose that because artists are inherently adept at
  perceiving actuality as a consequence of their close
  relationship with the artistic mindset, it would be
  sensible for artists to become consultants or even
  members of the research groups that are developing
  The New Emerging Technologies, as artists could help
  them grow past the tunnel vision these groups tend to
  develop as a consequence of their insular nature, and
  could also help them conduct their work in way more
  innovative ways.

- As a recent study published by McWilliams proves,
  those times that research groups have incorporated
  the perspective provided by artists into their work,
  the output of said teams has become significantly
  more innovative and way less biased (McWilliams,
  2018), a fact that I attribute to the incorporation
  of the artistic mindset into said groups by those
  artists.

- In turn, this behavior would also be in tune with the
  humanist interpretation of art and science as two

sides of the same coin, a concept that was
extensively proved in the renaissance era by all
those individuals who managed to unite both
disciplines into a synergic one, giving birth to many
of the technologies and art forms that caused the
emergence of the modern era (AIC, 2022).

- However, I argue that because of the complexity of
  the new emerging technologies, it would be more
  reasonable for artists to become a part of research
  groups instead of becoming fully independent
  researchers, for only a sizable group of individuals
  would be able to sensibly perceive all the
  ramifications the creation of these technologies
  could have.

- Consequently, I argue that in the context of *The
  Machine at the Crossroads*, the large-scale
  incorporation of artists into research groups could
  help those groups develop these technologies in way
  more innovative and sensible ways that are
  significantly more tuned to the realities of the
  world, which could significantly contribute to the
  sensible overcoming of the crossroads.

- In turn, this development would also open a very
  significant new professional venue for artists, who
  could pair their creative work with being consultants
  to research groups.

- Nevertheless, I argue that this venture would only be
  successful and effective if the artists that choose
  to participate in the development o the new emerging
  technologies manage to embrace the artistic mindset
  and their own life in a way that is sensible and
  aware of the nature of the crossroads, something I
  argue could only be accomplished thanks to a

redefinition of academia and education that is tuned
to the nature of our species, the nature of
technology, and the nature of the crossroads on
itself.

Artificial Intelligence

Can increase the creative potential of
artists exponentially. Endangers the
non-strictly artistic creative professions.

Augmented Reality

Can be utilized to redefine the perception
of the world in an unprecedented manner.
It can be sensorially overwhelming.

Virtual Reality

Can be utilized to create fully immersive
realities in a virtual format. It can be
sensorially overwhelming.

Body Augmentation

Can be utilized to tune one's body to one's
perception of the world. Can be extremely
dangerous if used insensibly.

Art and the new emerging technologies, diagram

There is much else that could be said in regards to how the
artistic disciplines and the new emerging technologies could
possibly interact in the following decades, but the sheer amount
of variance and complexity that will more than likely define
said interactions makes it unfeasible to delve into that topic
beyond the analysis and postulates I have already posed. As I
have explained, I argue that it will be essential for artists to
study, understand and learn to sensibly utilize these

technologies to the extent of their capacities if they are to continue their work in the world these technologies will define, even if they don't integrate them into their creative processes, for their impact on our everyday lives will be so significant that it would not be feasible to conduct a proper exercise of the artistic mindset otherwise.

Ultimately, I argue that a sensible redefinition of the academic and educational disciplines in tune with the nature of our species, the nature of technology, and the nature of the crossroads will be necessary to allow individuals to properly understand and learn to utilize the new emerging technologies, which would be as relevant for artists as it would be for everyone else. I argue that only from such a redefinition could a new sensible form of Bauhaus tuned to *The Machine at the Crossroads* emerge.

8.1.4 A necessary perspective: *Artists as advisors*

In my analysis of the nature of <u>The Machine at the Crossroads</u>[7.1], I pointed out how the characteristics and limitations that define our tribal mind are likely going to <u>significantly constrain our capacity to sensibly overcome it</u> [7.2.3] unless if we manage to reconcile said tribal nature with the nature of technology and civilization. In this context, I argue that artists could help our species solve, at least partially, one of the most significant hurdles imposed by our tribal nature: our perceptive dissonance in what concerns the perception of actuality.

In essence, **I pose that artists, because of their innate mastery of the creative process and their ability to perceive actuality through the exercise of the artistic mindset, could act as advisors for most of the human disciplines**, helping those disciplines become more innovative, responsible, and aware of actuality. I argue that this development would be extremely beneficial for both artists and for our species as a whole because, on the one hand, it would open a very significant professional venue for artists to undertake in parallel to their work as professional artists, while on the other it would significantly increase our chances of sensibly overcoming the crossroads.

As I explored in the previous sub-chapter[8.1.3], there have already been many trials within the academic and scientific world to integrate artists into research groups, with said groups becoming way more innovative and sensible in the process (McWilliams, 2018). With many similar cases being successful in both the cultural (SIA, 2022) and business worlds (Hindi, 2020), either directly or indirectly involving the input of artists, **I argue that there exists enough evidence to support this postulate.** Even then, I argue that artists would not manage to completely solve our perceptive dissonances, as such a development would likely require a way more significant redefinition of our cultural and political structures, but their contribution could help those disciplines become more responsible, humane, conscious of the limitations of our mind and aware of the realities of the world.

However, I argue that for this venture to be successful, those organizations that would hire artists as advisors would have to treat them as such, not as conventional employees, because the constant exercise of the artistic mindset the artists perform defines their personality in such a way that is antithetical to the contemporary corporate culture. In essence, this would mean that such organizations would have to hire artists in a way that respects their individuality, and that does not attempt to make them a part of a hierarchical structure, treating them instead as agents that exist in parallel to the main structure of the organization.

Similarly, I also pose that, because of the nature of the artistic mindset[8.1.1] and the crossroads, **this development would only be beneficial if artists manage to develop their own selves sensibly and in tune with both actuality and the progressive unfolding of the world of tomorrow**, as I argue that their influence in those other disciplines would be negative instead of positive otherwise, as a consequence of their own perception being heavily biased. Given the current state of the world as I exposed

it in the sub-chapter titled <u>A Short-Sighted Leviathan</u>[7.3], I argue that only through a sensible redefinition of the artistic, academic, and cultural disciplines could this be achieved, a topic I'll explore in detail in the next chapter of this dissertation.

8.1.5 Art for the World of Tomorrow, Conclusions

●━━━━●━━━●━━━●▮

Because of the nature of <u>The Machine at the Crossroads</u>[7.1], it is not feasible to imagine how art would evolve in its latter stages, and much less so past it, as most of the paths the future will open up for us will only become clear if we decide to take them, or, failing that, if we are forced to take them. However, I argue that the artistic mindset and the artistic disciplines are bound to survive well past the crossroads independently of our resolution of it, as a consequence of their innate relationship to the nature of our species, as long as said resolutions do not completely alter the human nature or make us become extinct.

As follows, I will recapitulate my posed recommendations for contemporary artists and artistic institutions to follow in the context of the crossroads.

My recommendations for artists and artistic institutions in the face of the crossroads

- I pose that artists should attempt to study and understand the artistic mindset properly.

- I pose that artists should elaborate a deeply personal artistic style through the exercise of said mindset, both as a form of resistance against the influence of globalized culture, and as a way to define their work in the face of The Machine at the Crossroads.

- I pose that artists should undertake secondary
  professional ventures to complement their
  professional work until Universal Basic Income plans
  are enacted worldwide.

- I pose that artistic institutions should attempt to
  preserve the historical value and context of
  artworks.

- I pose that artistic institutions should attempt to
  help independent-thinking artists overcome the
  influence of globalized cultures and speculative
  markets by creating spaces in which they can conduct
  their work away from the influence of social networks
  and mass media.

- I pose that artists should attempt to understand the
  meaning of the Machine at the Crossroads and tune
  their perception of actuality towards the context
  provided by it.

- I pose that artists should learn how to sensibly
  understand and utilize the new emerging technologies,
  regardless of whether they are part of a creative
  process or not, for they are bound to define the
  world of tomorrow in a very significant way.

- I pose that artists should become advisors through
  the entirety of the human disciplines, as that would
  foster innovation and sensible perception worldwide.

   What I have tried to offer in this chapter are guidelines
for contemporary artists and cultural agents to follow so that
they might adapt to the emergence of the crossroads in a
sensible manner that could be beneficial to both the artistic
disciplines and to society as a whole, all with the intention of

helping foster a sensible redefinition of art that could possibly lead to a new artistic renaissance tuned to the humanist mindset[6.2], **a new form of Bauhaus tuned to the nature of The Machine a the Crossroads** that can bridge the symbiotic relationship that art has with technology with the demands, opportunities, and challenges offered by the world of tomorrow.

What said redefinition of the artistic disciplines would entail is not for me to determine, as I argue that it could only be defined in a sensible manner by the art world as a whole, and only when artists manage to become fully tuned to the artistic mindset and the realities of the World of Tomorrow, something that, as I have explained, could probably only come to happen after a sensible redefinition of academia is conducted in tune with our nature and the nature of the new emerging technologies, for I argue that only such an environment would be capable of helping artists sensibly reconfigure the art world in the context of the crossroads.

In what concerns the forms of art that complex synthetic or augmented intelligences could create, I can only say that we simply can not imagine what shape they would take, for we can't even fathom how those beings would even think, and much less so how they would perceive and interact with the world. Only time will tell what those beings will create, a prospect that is both intriguing and terrifying.

8.2 Postulate II: An Emergent Academia for the Future

The goal of my academic postulates, much as it was the case with my artistic ones, is to define a conceptual foundation from which a sensible redefinition of the academic and educational disciplines could be conducted in the context of The Machine at the Crossroads. This chapter aims to, based on my analysis of the **_nature of our species_**[7.2.3] and that of **_the crossroads_**[7.1], and taking the **_humanist postulates_**[6.2] as well as **_the postulates of The Black Mountain College_**[6.6] and **_Buckminster Fuller_**[6.4] as theoretical frameworks, to expose a series of possible approaches that could help define a more humane form of academia and education that is more tuned to our nature than the traditional educational systems, so that such an environment can help all individuals and societies prepare, adapt and overcome the challenges posed by the future, while also potentially helping them define a more sensible form of civilization in the process. These postulates do not aim to determine exactly how the academic and educational disciplines should be redefined in the face of the crossroads, but rather to serve as a guide that could help such a redefinition be conducted from the ground up and in an emergent way.

What research questions do these postulates address?

- These postulates explore how the academic and educational institutions could be redefined in a humanist way as a way to help overcome the Machine at the Crossroads sensibly, and thus address my ***first and fourth core research questions directly***[3.5.5], while ***also addressing my fifth and sixth core research questions indirectly***[3.5.5]:

- In which ways could education and academia help us make more responsible and equitable use of the new emerging technologies?

- In which ways could education and academia help us face the challenges of the future?

- How could education and academia adapt to the world of tomorrow sensibly?

- How could we make the cultural, artistic, and academic disciplines and institutions more appealing and accessible to the general population?

- How could we create a universally accessible digital environment capable of synergistically integrating the cultural, artistic, academic, and scientific disciplines? Would shaping such a network in the form of an emergent network benefit human civilization?

What subjects will these postulates explore?

- The definition and understanding of academia and education in the context of the history of our species and the crossroads, and the underlining of its essential role as the foundational aspect and framework of the human civilization.

- The analysis and posing of the ways through which the academic and educational disciplines could evolve to be more in tune with our nature and that of the crossroads, with the goal of defining a set of environments, networks, and tools that could help contemporary individuals overcome the crossroads and potentially redefine society in a more sensible way.

A Humanist Academia

A defense of the value of the humanist mindset in what concerns the redefinition of academia in the face of The Machine at the Crossroads.

Art, Science and Democracy

The posing of the artistic, scientific, and democratic mindsets as essential aspects of a humanist academic model.

An Academic Seed

The conceptualization of an academic seed that could give birth to a sensible worldwide academic environment.

Universality

The posing of Universality as an essential aspects of a humanist academic model.

An Emergent Academia for the Future

A postulate in favor of the creation of a humanist academia tuned to our nature and the nature of technology as a response to the challenges posed by The Machine at the Crossroads.

Technological Sensibility

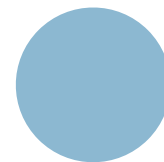The posing of Technological knowledgeability and responsibility as essential aspects of a humanist academic model.

An Emergent Academia for the Future, outline

8.2.1 Of human spirit: *Searching for a Humanist Academia*

There is much that can be said regarding the meaning and nature of academia, as it is an essential defining aspect of every single human being and of the human civilization as a whole. It can be argued that academia emerges from our curiosity, our endless pursuit of a better, more fulfilling life, and our desire for discovery and understanding. Therefore, it can be said that academia emerges from every single human being and that it is through it that our perception and comprehension of the universe can be pursued and encoded in a way that permits the foundation and advancement of civilization.

It can also be argued that, in its more fundamental form, academia is universally interdisciplinary, as it concerns all human interests and disciplines, and that consequently, it shares a very strong bond with the artistic mindset, culture, and the development, utilization, and nature of technology. It can also be argued that academia represents for the human civilization what the foundational aspects that define the artistic mindset represent for the human being, those being curiosity, perception, creativity, reason, emotion, knowledge, and memory and that therefore **academia can be considered to be to culture what those aspects are to the artistic mindset**[8.1.1]**, an essential set of features that emerged beforehand, and**

without which neither the artistic mindset nor culture could *come to be*. I back this definition in the emerging characteristics and abilities that define the evolution of intelligent beings, as explained by *Feinberg and Mallatt*, in which **the more foundational and practical aspects of intelligence precede the appearance of consciousness, the emergence of the sense of the self, and the desire for understanding** (John Hopkins Medicine, 2021).

Above all else, however, I argue that it is only through the synergy between all the defining characteristics of our species through the exercise of the artistic mindset and academia, and through the development and utilization of technology, that we managed to overcome, even if only partially, <u>the limitations posed by our tribal nature</u>[7.2.3], thus permitting the emergence and continued advancement of civilization and complex cultures.

However, as I analyzed in <u>the chapters dedicated to studying the nature of our species</u>[7.2], and <u>the pitfalls of contemporary human societies</u>[7.3], our reliance on technology, summed to the necessity of adopting increasingly specialized, hierarchical, and centralized governmental and organizational structures as a consequence of having to adapt to the exponentially escalating levels of information and data generated by the progress of technology and civilization, has progressively disrupted our species' perception of the world. As I exposed, this problem is way more relevant in what concerns the actions of those who occupy the higher echelons of society, for their perceptions and interactions with the world, while potentially capable of deciding the fate of billions of individuals, are still limited by the same tribal nature that defines every single other human being, and are therefore biased in favor of what they perceive as their immediate tribal space and time, at the detriment of everything and everyone else.

As I already explained, I argue that this is the crux of the problem that The Machine at the Crossroads represents: **unless we manage to reconcile our tribal nature with the nature of technology and the nature of civilization, we won't be able to overcome the crossroads, one way or another,** yet all seem to point out that contemporary world governments and power groups, far from attempting to solve this problem at its root, are just doubling down on the same flawed solutions we have utilized since the origin of our species. In the chapter Titled _In Search of synthetic Gods_[7.4] I exposed how those organizations are likely going to entrust all our chances of overcoming the crossroads on an arguably senseless utilization of the emerging technologies, and especially of artificial intelligence, hoping that the creation of automated governance systems will allow us to maintain the control of the emerging technologies long enough for us to either solve the crossroads or for us to merge our nature with that of technology through transhumanism. As I explained, because this is a venture that attempts to solve the crossroads without accounting for its root cause, I argue that it is bound to fail and that it would inevitably lead to a technological overload.

As I explained, I argue that as we venture forward through this century, it is very likely that the progressive emergence of the crossroads, summed to the flawed attempts of contemporary civilization to solve it, will leave an increasingly larger part of the human civilization abandoned against it, which is likely to cause an unprecedented level of social upheaval and conflict, but which also offers us a prime opportunity for us to redefine society from the ground up for the better, if only a sensible universal humanist academic framework would exist from which individuals could conduct said restructuring. But how could such an academic system be formed in the first place?

Throughout our history, there have been many experimental academic institutions that have attempted to redefine academia

in a humanist way, the most relevant examples in relatively recent times being those of *The Black Mountain College* (Keough, 2013) and *The Open University Project* (Beuys and Böll, 1973), but even if these organizations managed to prove that a humanist form of academia was not only possible but preferable to the traditional model, they lacked the resources and institutional support necessary to implement their ideas beyond the confines of the environments they had access to, largely because the governments of their time, much as those of the present day, were not interested in fostering the creation of academic institutions that would help individuals think creatively, critically and independently, an aspect that I argue could be key in our sensible resolution of the challenges posed by the future.

However I argue that the crossroads itself, and more specifically the advent of the new emerging technologies, and especially that of <u>Artificial Intelligence</u>[5.1.2.4] and the new <u>Computing and Communication technologies</u>[5.1.2.7], might finally allow our species, or rather force it, to transform academia for the better: on the one hand, **automation technologies and the rest of the emerging technologies will progressively eliminate the need for an extremely specialized human population, thus making the contemporary hierarchical educational model completely obsolete.** On the other hand, **those same technologies could be utilized to create universally accessible academic environments and tools similar in complexity and capacity to the most complex contemporary academic institutions and organizations,** thus giving academia a never seen before opportunity to redefine itself into a more humane institution capable of helping our species overcome the crossroads.

What I pose is that, against *The Machine at the Crossroads*, academia could utilize the emerging technologies to provide a foundational framework, composed of a series of academic tenets, environments, and tools found on the humanist principles through

which all human beings could sensibly redefine their own lives in accordance to the nature of our species, the nature of technology, and the nature of the crossroads, an academic environment through which all individuals could also become aware of the challenges posed by the future and develop solutions for them in an emergent way that accounts for the entirety of our species. I argue that such a development could potentially lead to a sensible redefinition of human civilization, and a positive resolution of the crossroads that does not necessarily alter our nature in the process.
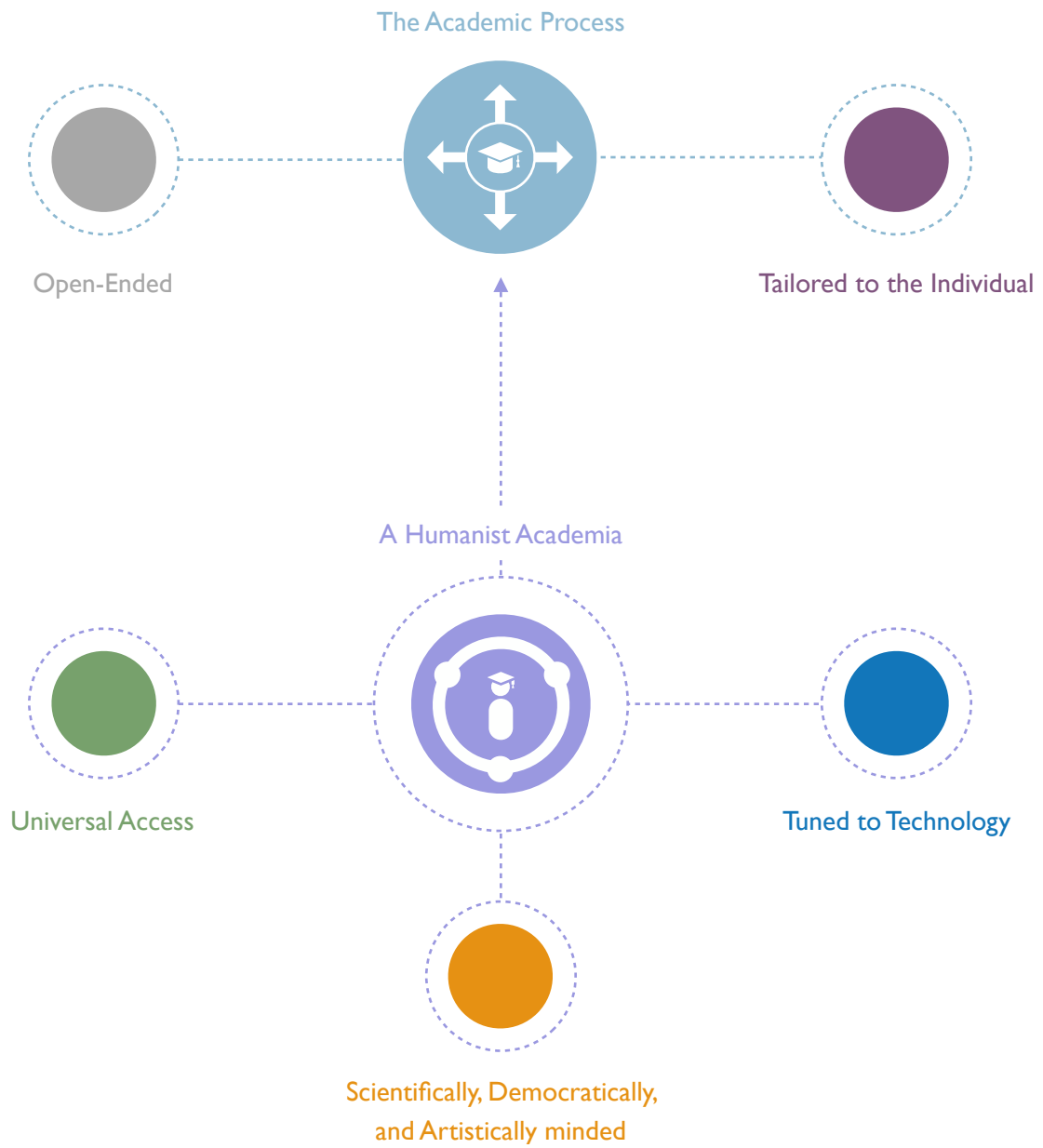
Now well, how should contemporary academia be redefined to allow such a development to be successful? As I already pointed out in my artistic postulates, I don't believe that it would be sensible for a single individual to determine what such a redefinition would entail, so my academic postulates will be centered on exposing the fundamental aspects that I consider such a redefinition would require, based on my analyses of the matters at hand, so that a complete redefinition could be constructed a t a later date by a sizable group of academics.

What would be the defining characteristic of a humanist form of academia tuned to our nature, the nature of technology, and the nature of The Machine at the Crossroads?

- I argue that academia would have to make the artistic, scientific, and democratic mindsets core aspects of its nature and organizational structure, as I argue that the fostering of each of those mindsets would be necessary for humans to be able to develop a sensible and synergic relation between their tribal nature, the nature of technology and that of the world.

- I argue that academia would have to be Universally
  and equally accessible to all human beings, both in
  regards to its educational and research-focused
  aspects, for its impact would be too limited and
  biased otherwise.

- Similarly, I argue that academia would have to be
  democratic and non-hierarchical and that it would
  have to mimic the defining organizational structures
  and size limitations of tribal groups, for only such
  structures would be tuned to our tribal nature and
  would therefore offer a sensible environment from
  which to conduct the academic process. This
  development would also imply the bridging of the
  educational, tutoring, and research aspects of
  education into a seamless and non-hierarchical
  structure.

- I argue that academia would have to foster the
  academic process as an open-ended life-long venture
  that would account for, within reason, all the
  aspects of human life, not just for the professional
  disciplines, as I argue that the development of both
  personal and disciplinary skills through the entire
  life of an individual will be essential to adapt to
  the constantly changing nature of the world of
  tomorrow.

- The aspects defined so far would contribute to
  academia being able to account for the uniqueness of
  each human individual and each human culture, while
  also accounting for the limitations imposed by our
  tribal nature, thus providing a sensible foundational
  framework from which to face the crossroads and
  redefine the human civilization in a more sensible
  way.

- I argue that, on a fundamental level, academia would have to be ideologically, politically, and economically neutral aside from being aligned with humanist principles. Therefore, it would have to separate itself from the influence of specific ideologies and the private markets as much as possible, and it would have to find an alternative space in which to exist. This aspect would be essential, for I argue that academia would be too biased to be of truly effective use against the crossroads otherwise.

- I argue that it would have to account for the nature of technology and our relation towards it, striving to promote responsible and sensible use of it, which would be an essential undertaking if academia is to prevent the occurrence of a technological overload. It would also have to incorporate the sensible understanding and utilization of automation and artificial intelligence technologies as a defining aspect of its tenets and organizational structure, as I argue that only by doing so would academia be capable of reaching every single individual on the planet.

- It would have to account for *The Machine at the Crossroads*, and would therefore have to dedicate a significant amount of resources to its understanding and resolution.

The Academic Process

Open-Ended

Tailored to the Individual

A Humanist Academia

Universal Access

Tuned to Technology

Scientifically, Democratically,
and Artistically minded

A humanist academia, diagram

Evidently, I recognize that the creation of an academic environment that would incorporate all these characteristics into itself would be an extremely difficult task even if the new emerging technologies were to be utilized to shape it. This is why, in this chapter, I'll explore all these aspects, exposing how those technologies could be utilized to create environments and tools that would utilize them. As I previously pointed out, **all these postulates are created considering <u>the many reforms and societal developments that, for better or worse, contemporary civilization is attempting to enact against the crossroads</u>**[7.4]**, and especially under the pretext that world governments will sooner rather than later be force to implement <u>Universal Basic Income plans</u>**[7.4.1] **through their territories in response to the first stages of The Machine at the Crossroads,** as I argue that only thanks to the economic aid offered by those plans would society remain stable enough to allow these postulates to be of any use, as the individuals who could potentially benefit from my posed systems would not be economically or socially independent otherwise.

8.2.2 Aspect I: *The Artistic, Scientific and Democratic Mindsets as defining characteristics of academia*

As I have explored in the previous chapters, I argue that if academia is to be restructured in a way that can help our species redefine civilization sensibly and overcome the Machine at the Crossroads, it has to account for the most significant aspect, strengths, and limitations that define our nature[7.2.3], in relation to the nature of technology[7.1.5], the nature of civilization[7.3] and the nature of the crossroads[7.1]. In this regard, I pose that the adoption by academia of the **Artistic, Scientific, and Democratic mindsets**, both as essential tenets to be taught to all human beings and as defining structural aspects of academia itself, would go a long way in allowing this redefinition to be conducted in a way that synergizes our nature with that of technology and civilization.

In what concerns *The Artistic Mindset*, which I defined in the previous chapter[8.1.1], I argue that its adoption by academia would be essential to encourage the individualistic, curious, innovative, and passionate nature of the human being, both as a way to help individuals develop their lives in tune with their personalities and emotions in relation to the nature of the world, and to encourage innovation and progress. Most significantly, I argue that the teaching and promotion of this

mindset would be fundamental to allow individuals to adapt to the advent of automation and artificial intelligence technologies, for **it could help them reconfigure their lives in a fulfilling and productive way once the automated systems overtake most traditional professions.**

In regards to the challenges posed by the crossroads as a whole, **I argue that the fostering of this mindset would go a long way in helping all individuals adapt to the challenges posed by the future in innovative, fulfilling, and productive ways,** which could be especially beneficial for those individuals who become abandoned in the face of the crossroads by their governments. In a broader sense, **I also argue that the large adoption of this mindset would contribute very significantly to the fostering of cultural diversity and innovation throughout the entirety of society,** which would directly counter two of the most glaring weaknesses of contemporary civilizations in the face of the crossroads: their preference for maintaining the status quo and their encouragement of cultural homogenization.

In regards to the structure of academia itself, **the adoption of this mindset would imply the restructuring of the entire academic process into one that accounts for the specific personalities, needs, and desires of each individual,** and that helps them form themselves, and contribute their experience and research if they so desire, in accordance to those characteristics through their entire life. Therefore, I argue that the adoption of this mindset would necessitate the transformation of academia into an open-ended system unbound from specific professional goals and that the ways through which it would have to impart knowledge, evaluate said knowledge, and help with the collection and development of new knowledge through the encoding of experience and research, would have to be tailored to the needs of each individual, as I argue that only by doing so could the artistic mindset be adopted and fostered successfully.

In regards to that last point, I argue that the history and achievements of *The Black Mountain College* (Keough, 2013) prove that for the artistic mindset to be successfully fostered in the population at large, it is essential that said mindset is adopted by academia in a structurally defining manner that adapts to the needs of each individual. Similarly, *The Black Mountain College* posed that the fostering of such a mindset would also necessitate the adoption of experimentation and experience, instead of the studying of previously accumulated knowledge as it is custom in traditional academia, as the main forms of learning, for their founding members argued that only through self-experience could the individual truly learn and form themselves in tune with the nature of the artistic mindset. However, the evolution and eventual downfall of this experimental college proved this postulate to be insensible. Its extreme focus on experience-based learning led each consecutive generation of students to commit the same mistakes over and over again, exhausting the faculty and its resources.

Therefore, I argue that, while the encouragement of learning through experience and experimentation should be an essential part of a sensible redefinition of academia, for both are defining aspects of the artistic mindset, said encouragement should never come at the cost of sensible studying of previously recorded knowledge. Therefore, **I pose that both learning and teaching methods should become defining characteristics of academia in a balanced way, with the teaching and studying of encoded knowledge providing a fundamental framework from which to learn from experience and conduct research.** On the one hand, the studying of previously encoded knowledge would allow individuals to learn from past experiences sensibly, keeping them from committing the same mistakes made by previous generations. On the other hand, learning from experience would allow individuals to grow past the limits of said accumulated knowledge while also permitting them to contribute to said

knowledge database through the encoding of their own experiences and research.

Ultimately, however, while I argue that the adoption and teaching of the artistic mindset by academia would be essential to foster cultural diversity and innovation, and to help individuals sensibly adapt to the world of tomorrow in a fulfilling way, I also argue that such a mindset, just by itself, would not be enough to complete a sensible redefinition of academia, as it would require to be paired with the Scientific and Democratic mindsets to keep its defining characteristics from becoming detrimental to the individual, because, **if not sensibly developed, the artistic mindset, as a consequence of its individualistic and passionate nature, can disrupt the perception of reality and encourage narcissistic, inconsiderate, irresponsible and even destructive behaviors.**

At this point, I consider that we should address the *Scientific Mindset.* I argue that the adoption and teaching of this mindset by academia, as defined by *Deanna Kuhn* (Kuhn, 2010), would very significantly contribute to fostering rational thought, curiosity, and criticality among the general population. I argue that, when paired with the teaching of the artistic mindset, the scientific mindset would establish a synergic relation with the former, as the best aspects of each mindset would enhance those of the other and suppress their respective weaknesses.

In this context, the Scientific mindset on itself encourages the individual to be curious about the universe, to seek knowledge, and to conduct experimentation in a critically-minded way to satisfy that curiosity. I argue that the fostering of these aspects through the entirety of the human population, and especially the encouragement of seeking knowledge rationally through proof checking and the contrasting of information, would go a long way in helping our civilization redefine itself

sensibly in the face of the crossroads, for, as I previously exposed, <u>the decay of criticality is one of the most glaring weaknesses of contemporary society</u>[7.3], and this mindset would encourage individuals to adopt a critically minded and secular outlook towards their life and the world.

On top of that, I also argue that the fostering of the scientific mindset within academia would be of special importance towards the studying of previously accumulated knowledge, learning from experience, and experimentation, as it would allow individuals to not only generate new knowledge sensibly but to treat the accumulated knowledge of our species as a constantly evolving framework rather than as an unalterable monolith of information and values, fostering sensible progress further. While it is true that traditional academia already fulfills this requirement to a significant degree, it is also arguable that its highly competitive and compartmentalized nature compromises its proper exercise of the scientific mindset (McWilliams, 2018).

In what concerns the artistic mindset, and as exposed by *Hal Foster* (Foster, 2015, p. 140–155), **this encouragement of criticality and the scientific process would help counteract the biased self-righteousness and perceptive dissonance that said mindset tends to generate on the individual if it is exercised in isolation**, <u>as the current state of the art world demonstrates</u>[7.3.4]. **In return, I argue that the fostering of the artistic mindset would help counteract the emotional disconnection, apathy, and extreme disciplinary focus the scientific mindset tends to generate on individuals**, as proved by the success of the social experiments involving the incorporation of artists to scientific research teams (McWilliams, 2018). Consequently, **I argue that, in synergy, the scientific and artistic mindsets would help individuals think outside the box with more ease, enhancing their creativity and driving innovation further in the process, in a way that is**

critically minded, fulfilling for the individual, and is not emotionally disconnected from reality. This postulate is in tune with the secular humanistic definition of the human mind[6.2] in what concerns the relation of the artistic and scientific mindsets, which poses that those two aspects are two sides of the same coin, instead of two completely separate ones.

Now well, in what concerns the structure of academia, **fully embracing the scientific mindset would imply redefining it in a way that gives all of its participants the environments and tools necessary to exercise criticality, objectivity, and fact-checking through the entire academic process,** which would necessitate the creation of universally accessible knowledge databases and networks, automated fact-checking and referencing tools, and Virtual Intelligence based research assistants, among many other elements, a topic I will explore further in the next sub-chapter. Lastly, I argue that, in order to fully account for the need for criticality, the embracing of the scientific mindset would imply that **academia would also have to provide the knowledge, environments, and tools necessary to gather, provide and have access to truthful information about the events of the world.** I argue that this development would be essential to face the crossroads sensibly, as it could largely eliminate the biases generated by traditional news networks and media outlets.

Having already argued for the significance of adopting the Artistic and Scientific mindsets by academia if it is to be sensibly redefined, let us now explore what I consider to be the last piece necessary to complete this redefinition, *The Democratic Mindset.* While I argue that the adoption of the previous two mindsets would go a long way in helping our species reconcile its artistic and scientific aspects in a synergic and positive way, **those two mindsets would only account for an individualistic perspective of the world that would be limited by our tribal nature, which would not prevent the individual**

from behaving extremely amorally and irresponsibly towards everything that exists beyond their perceived tribal space.

What I argue is that, while those two mindsets would encourage the individual to behave sensibly, emotionally, and to think critically towards others and the world, this positive behavior would be limited to the confines of the tribal space. I argue that in order for this behavior to be of use to human society as a whole, academia would have to adopt and transmit the Democratic mindset alongside the artistic and scientific ones, for, <u>as I have previously explored</u>[7.3.1], **I pose that this mindset, when applied to the organization of society, and if exercised from a critical and sensible standpoint from all of its participants, would allow individuals to organize and interact among themselves and towards the world sensibly well beyond the tribal space.**

On its own, the fostering of the democratic mindset would encourage individuals to perceive themselves as parts of a community because, on the one hand, it would urge them to become active participants in the organization of society, while on the other it would make them feel accountable for all their actions in regards to not only the tribal space but towards human society and the world as a whole. I argue that this perception of accountability would be key because, while the number of emotionally driven deep relations an individual could develop would still be limited by their tribal nature, **the sense of accountability would transcend those limitations, urging them to act sensibly and responsibly towards what exists beyond their perceived tribal space,** as long as their perception of the rest of the world was achieved from a critical standpoint, which the scientific mindset would provide.

Evidently, however, for this behavior to be truly successful, human societies would have to treat all of its citizens equally in regards to their accountability, which is by

all accounts something easier said than done, but in regards to which I argue that the adoption of the democratic mindset by academia would very substantially help achieve, especially if a sensibly redefined academia helps humanity redefine itself in the face of the crossroads once contemporary societies become unable to adapt to it. Similarly, I also argue that the proper exercise of this mindset would necessitate an abandonment of extremely hierarchical and specialized organizational structures, for those structures tend to facilitate the delegation of responsibility to others, a necessity that aligns with the nature of the artistic mindset, and which would contribute to driving cultural, scientific and ideological diversity further. Needless to say, this postulate would be incompatible with any form of authoritarian government, for I argue that their structure tends to eliminate any real sense of accountability in the higher echelons of their organizational structure.

In parallel to this perception, I also argue that the fostering of the democratic mindset would help individuals understand that their lives, and the lives of those that are close to them, can be significantly better if they become active participants of the definition and organization of society than If they do otherwise. While it is evident that the democratic process just by itself can be extremely harmful to society if its participants do not act sensibly, critically, responsibly and with the necessary knowledge, **I argue that the parallel fostering of the artistic and scientific mindset to the democratic one through academia would counter those problems,** with the sense of community and accountability promoted by the democratic mindset countering the narcissistic aspects of the artistic mindset and the extremely insular aspects of the scientific mindset in return. Now well, how could academia foster the democratic mindset? Leading by example, of course: on

top of instructing about this mindset, I argue that academia would have to adopt a democratic structure.

The development of a democratic academic environment would imply that all the aspects that would define any given specific academic organization would have to be determined democratically by all of its constituents, a process that would have to be conducted through the exercise of critical thought, common sense, and responsibility, and that would necessitate the abandonment of the extremely hierarchical and centralized structure of traditional academia in favor of a far less hierarchical model. As the Black Mountain College demonstrated[6.6], these developments, if sensibly executed, would significantly contribute to making the academic environment a way more humane place that considers the opinions of all the participants, thus fostering the democratic mindset of all the individuals that participate in it.

While I argue that it would not be sensible for me to determine the exact nature of this non-hierarchical and decentralized academic structure, I pose that such a redefinition would have to be conducted in accordance with both the egalitarian nature that defines tribal structures and the perceptive limitations that are imposed into us by our tribal mind. In regard to that first aspect, I argue that this would imply that the whole of the academic hierarchy would have to be redefined into one composed of only two levels based on the overall academic level of the individual and its contribution to the academic world, **those being the Student and the Academic,** with the Student being entitled to studying, encoding their experience, and being able to democratically participate in the definition of the non-critical aspects of academia, and with the Academic being entitled to conduct advanced research and being able to democratically participate in the definition of the critical aspects of academia, on top of also being entitled the privileges of the student. I also argue, in tune with the

experiments of *The Black Mountain College*, that for this structure to be successful, each of the parts would have to treat the other one in a sensible, responsible, and critically minded manner, with both being open to learning from the experience of the other (Keough, 2013).

In what concerns the adoption of an organizational structure in tune with our tribal nature, **I argue that academia would have to redefine itself into a form inspired by those very tribal structures**, in a way that accounts for both specific academic disciplines and personal interests. In this context, I argue that the size of each particular academic group would have to be inversely proportional to its focus in order to account for the perceptive dissonance caused by our tribal nature as determined by *Dunbar's Number* (Lumen, 2021), with specific colleges being composed by a couple of thousand individuals at most, and with specific studying and research groups being made by a couple tens of individuals who have similar interests and ways of being. Similarly, I also argue that the smaller groups would have to permit the emotional bonding of their participants, either through physical presence or through augmented reality systems. Needless to say, **I argue that academia would have to teach about our tribal nature to all of its participants**, as that would help our species become aware of its strengths and limitations in a way that, through the exercise of the artistic, scientific, and democratic mindsets, would encourage all individuals to act sensibly.

This concludes my evaluation of why the adoption and fostering of the artistic, scientific, and democratic mindsets by academia would be essential not only to accomplish a sensible redefinition of the academic institutions, but to conduct a sensible redefinition of the human civilization that would be in tune with our nature, the nature of technology, the nature of society, and the nature of *The Machine at the Crossroads*.

8.2.3 Aspect II: *Universality*

I pose that if academia is to be redefined in a sensible way that allows it to become an environment capable of helping our species overcome The Machine at the Crossroads and restructure itself in tune with our own nature and that of technology, **it has to account for the necessity of reaching every single individual on the planet in an equitable manner**, with would imply the creation of a free to use universally accessible academic environment capable of offering all human beings an equal set of tools, databases, and networks through which they could access academia on its entirety. I argue that failing to account for this need for universality in a redefinition of academia would very severely compromise its positive value towards society, thus compromising the entire redefinition.

I base this need for universality on two fundamental factors: first, **on the humanist principle of equal access to opportunities in life**, which establishes that only academia capable of offering all human being the same opportunities independently of their origin and socioeconomic status would be truly humane and moral. Second, **on the need for balanced diversity set by the laws of evolution and natural selection**[5.3.2.4], which determines that a species has to develop and maintain a diverse set of characteristics to be able to

successfully adapt to the changing environment, which, in the context of the human academia, would imply the creation of an environment that is by itself diverse enough, and that allows its participants to develop their abilities and conduct their research in a way that respects their individual personalities, which could only be sensibly accomplished in a manner that would be representative of the whole of humanity if said academic systems become universally accessible.

Consequently, I pose that the universalization of academia would have to account for three of its fundamental aspects, **education, research, and tutorship,** with universal education allowing individuals to retrain and redefine themselves in tune with our nature, the nature of technology, and the nature of the crossroads, and with universal research and tutorship allowing individuals to contribute their experience and knowledge towards the rest of society, thus allowing our species to perceive and counter the crossroads in an emergent and sensible way. I also argue that this universalization would have to be conducted in a democratic way that would have to distance itself from the extremely hierarchical nature of traditional education if it was to be truly effective, a topic I will explore in the next sub-chapter.

But how could the universalization of academia be accomplished in the present day? As *Buckminster Fuller* exposed in his book *Operating Manual for Spaceship Earth* (Fuller, 1969, p. 13), the evolution of academia through the history of our species has been bound to the evolution of civilization in itself, progressively transforming it into what it is today, for better or worse. While it is evident that traditional academia has played an essential role in regard to the development of civilization and the betterment of the human being, it is equally as evident that academic institutions have never been able to reach every single individual on the planet in a sensible, democratic and egalitarian way, a fact that can be

attributed to the impracticality of doing so as a consequence of the technological, ideological and resource-related constraints that have defined human societies through our history.

It is true that academia has become progressively more accessible throughout the world as technology and civilization have progressed, but as exposed by *Fuller* in *Operating Manual for Spaceship Earth* (Fuller, 1969, p. 13), the hierarchical and increasingly specialized nature of human society forced academia to become a tool in service of said organizational structure, therefore determining that only those who occupied or managed to reach the higher echelons of society would have access to academia in a substantial way, with the rest being allowed access only to the extent they would need to become a specialized part of the human hierarchy. As I already explored and exposed, **contemporary academia is still largely defined by this mindset**[7.3.3], which significantly impairs our species' innovative and adaptational capacity in the face of the crossroads. All in all, the evidence seems to point out that contemporary academia has come to an evolutionary dead end at the worst possible time.

However, as I have previously explained in this chapter[8.2.1], I argue that the advent of *the new emerging technologies,* and that of *The Machine at the Crossroads* as a whole, will provide our species with both the necessity to conduct a sensible redefinition of academia in tune with the humanist principles and the tools necessary to achieve it in a universal scale. In what concerns the specific topic of the universalization of academia, I argue that automation and artificial intelligence technologies, alongside the new information and communication technologies, could potentially allow us to create a new generation of Ai-powered academic environments and tools not only capable of reaching every single individual on the planet but of doing so free of charge and in a

way that allows for each individual to customize their academic experience to their personal needs and ways of being.

Let's now explore what a sensible universalization of academia based on the utilization of the new Artificial Intelligence and Communication technologies would entail.

What would the universalization of education entail?

- I argue that the fostering of universal education in the context of the machine at the crossroads would imply the creation of a series of environments and tools that would allow every single human being on the planet access to the full extent of the educational process, free of charge, and independently of their origin, culture and socioeconomic state.

- I argue that the universalization of education will be essential to prevent a very sizable part of the human population from becoming displaced by the advent of the new emerging technologies and challenges.

- Ultimately, I argue that If academia as a whole was to be redefined sensibly, the universalization of education would allow individuals to redefine themselves in a way that is tuned to the nature of our species, the nature of technology, and the nature of The Machine at the crossroads, thus arguably increasing our chances of overcoming the crossroads.

What would the universalization of research entail?

- I argue that the fostering of universal research in the context of the machine at the crossroads would imply the creation of a series of environments and tools that would permit all human beings to sensibly conduct academic research and encode their experiences and knowledge for academic use independently of their chosen discipline and overall academic level, as long as they follow a standardized set of academic guidelines to conduct their research work.

- I argue that this universalization of research, if sensibly conducted, could allow our species to benefit from the collective experiences of every single human being, with each human contributing the experiences that emanate from their lives and chosen disciplines in a way that is proportionate and sensible to them.

- I argue that this development if sensibly executed, could drastically increase our chances of overcoming the crossroads successfully, for it would allow us to progressively perceive and adapt to it in a way that would emanate from the whole of humanity.

What would the universalization of tutorship entail?

- I argue that the fostering of universal tutorship in the context of the machine at the crossroads would imply the creation of a series of tools and environments that would allow all individuals to become sensible tutors of their chosen disciplines, either in a direct or personal way or through the

encoding of their tutoring persona through the
creation of a Virtual Intelligence system.

How could emerging technologies help us create a universal academic environment?

- I argue that Artificial Intelligence and Automation
  technologies could be utilized to create a largely
  automated set of digital academic databases,
  environments, and tools comparable in complexity to
  those of physical academia, at a small fraction of
  the cost in regard to both their creation and
  maintenance.

- The automation of academia would allow for the
  entirety of the academic experience to be
  personalized to the requirements and personalities of
  each individual.

- In regards to education, Ai technologies could be
  used to create a plethora of virtual academic spaces,
  databases, and tools that could fulfill the roles of
  a complete academic environment, with Virtual
  Intelligence programs acting as intermediaries
  between the student and the network. These Vis could
  guide and tutor the student through the entire
  academic process as a human would, without the need
  for real human intervention in most cases, and could
  help each individual adapt the structure of said
  process to their needs and ways of being.

- In what concerns the universalization of research, Vi
  programs could be created to assist individuals in
  encoding their experiences and in researching. As
  these programs would automate most of the structural
  aspects of research and would ease the difficulty of

conducting the research process as a whole, they
could allow all individuals, no matter their chosen
discipline or academic level, to conduct research and
encode their experiences in a way that would follow
all academic guidelines. Similarly, those Vi programs
could allow a single individual, or a small number of
them, to conduct the research that nowadays requires
the work of hundreds of individuals.

- Regarding tutorships, Ai technologies could be used to
  create and share tutor Vi avatars, thus permitting a
  single individual to indirectly tutor millions of
  individuals indirectly throughout the entire world.

- I argue that the Internet of Things technologies would
  allow such automated environments to be integrated
  seamlessly with the real world, allowing its users to
  utilize them just as if they were participating in
  purely physical academia, with the added benefit of
  having seamless access to the information networks.

- I argue that the advent of automation itself will
  cheapen the cost and diminish the difficulty of
  constructing complex information and communication
  systems so much that it will allow for an academic
  environment such as this to emerge throughout the
  entirety of the world, as long as those who
  participate on this form of academia learn how to
  expand the network by themselves.

- Ultimately, I also argue that for the universalization
  of academia to be successfully accomplished through
  Automation, Ai utilization, and IoT technologies, the
  sensible understanding, and utilization of said
  technologies would have to be taught and encouraged as
  a central aspect of academia on itself, a topic I will
  explore further down the line in this chapter.
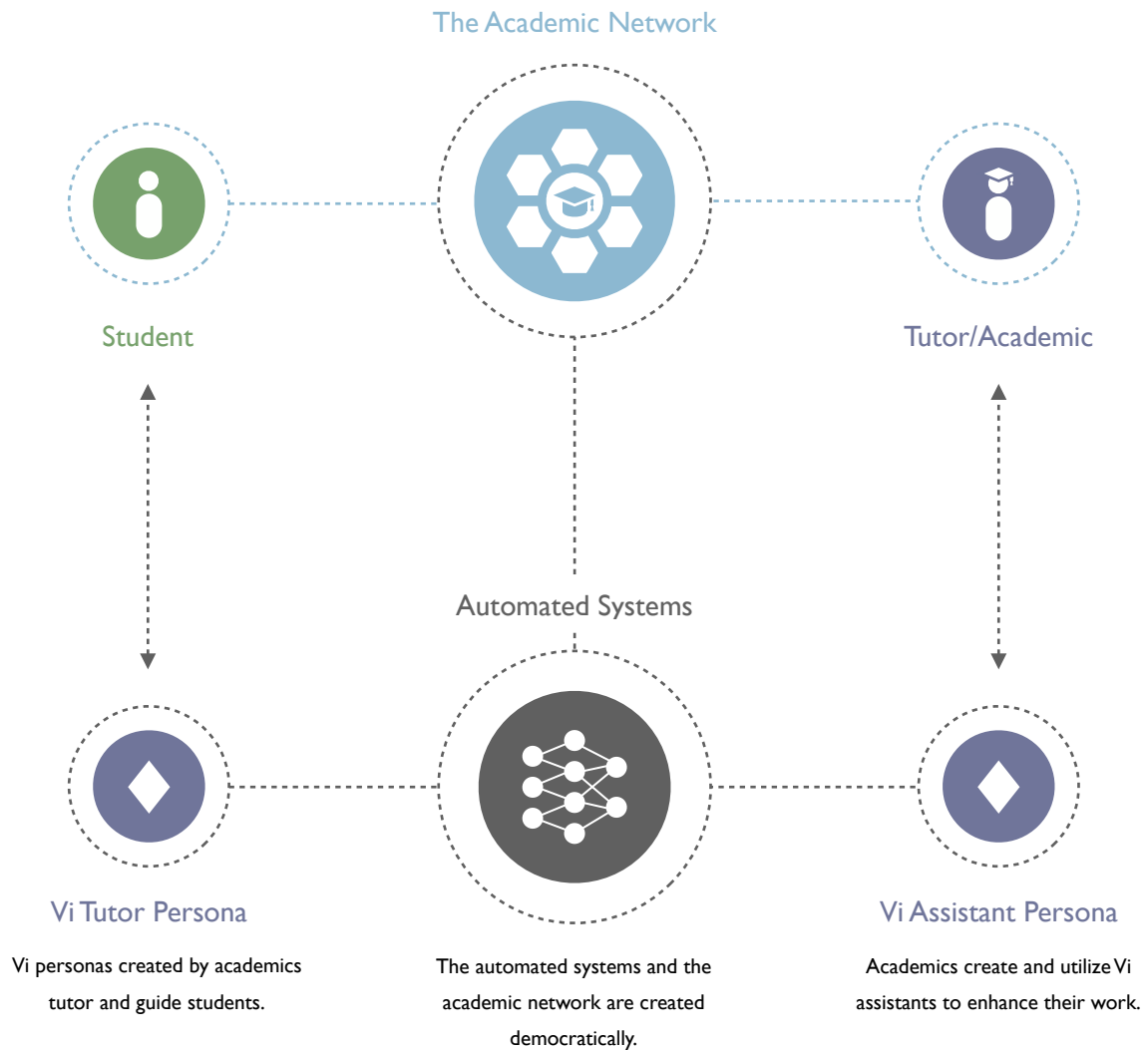
Academic universality through AI, diagram

Now well, even if I pose that the new emerging technologies would allow for the universalization of academia through the use of Artificial Intelligence and The Internet of Things, I also argue that academia would also have to be redefined in what concerns the physical reality for it to be sensibly reshaped, a process that I argue should be conducted in tune with the democratic values and our tribal nature, as I'll explore in the next sub-chapter.

8.2.4 Aspect III: *Technological Knowledgeability and Responsibility*

Through this dissertation, I have analyzed the key roles that the relationship that our species has developed with technology, and the use we have made of it throughout our history, have played in defining the evolution of the human civilization, ultimately posing that only if we manage to reconcile our tribal nature with the exponentially evolving nature of technology through a sensible redefinition of our civilization, something that has been elusive for our species so far, could we hope to overcome *The Machine at the Crossroads* sensibly, <u>at risk of being overwhelmed by technology otherwise</u>[7.1.5]. Therefore I argue that this aspect of Technological Knowledgeability and Responsibility would have to be paired with the fostering of the artistic, scientific, and democratic mindsets, as well as with the universalization of the academic institutions and tools, for academia to be completely redefined in a way capable of helping our species be redefined into a more sensible form.

In general terms, I pose that academia would have to help individuals understand and learn to sensibly and responsibly utilize the emerging technologies that are set to define the world of tomorrow, as I argue that only by doing so would individuals be able to perceive and interact with said world

fully. To achieve this, I argue that academia would have to account for three fundamental aspects of technology: **the understanding of the relationship our species has developed with technology, the understanding of the nature of the technologies that are set to define the world of tomorrow alongside the learning of how to utilize them sensibly, and the adoption of the new emerging technologies into the structure of academia.**

Aside from those aspects, I argue that there is one last and very significant mindset that academia should attempt to foster to the general human population in what concerns the nature of intelligence, sapience, and life, **that those artificial beings that have an intelligence and sapience level comparable to those displayed by living organic beings should be treated as living beings worthy of rights and obligations similar to those enjoyed by their natural counterparts,** with those rights and obligations being adapted to their defining characteristics, no matter if those beings are biological or cybernetic in nature.

In practice, this mindset would imply that those artificially created beings comparable in intelligence and sapience to animals should be treated as such, and that those comparable to human beings should enjoy rights and obligations similar to ours. I argue that the teaching of this mindset would encourage the definition of a new generation of universal sapient rights, which could be fundamental to fostering the sensible creation and incorporation into our civilization of complex synthetic beings such as Artificial General Intelligences and uplifted animal species, a development that I argue would be key to overcome the crossroads. On top of this, I argue that the promotion of this mindset, alongside the fostering of a sensible general mindset by academia, **would very significantly contribute to assuring that the development and creation of complex Artificial Intelligence systems are conducted in a reasonable and humane way.**

How could academia help individuals understand our relationship with technology as a way to foster a more sensible use of technology?

- I pose that to achieve this goal, academia would have to expose the strengths and limitations imposed by our tribal nature in relation to the nature of technology on itself, as well as explain the dependency we have developed on technology as a way to grow past the limitations of our tribal mind, and the technological overload said dependency might lead us to if we don't manage to reconcile both of those natures through a sensible redefinition of civilization.

- I argue that this development, if conducted alongside and in a similar manner to the fostering of the artistic, scientific, and democratic mindsets, would encourage individuals to understand and utilize technology more sensibly, as the perception of the nature of technology in relation to our own would help them understand that if one utilizes it in an insensible manner, it might overtake them.

How could academia teach individuals to understand and sensibly utilize the new emerging technologies as part of their everyday lives?

- I argue that the most sensible way to conduct this process would be to expose and teach each specific form of technology, emerging or otherwise, as a form of language through which we can grow to part our natural limitations and interact with the world in more complex ways.

- I argue that academia would have to equate the relevance of learning to utilize these technologies to learning the abilities of hearing, talking, reading, writing, and mathematics, thus presenting them as essential to participate in everyday life from a foundational standpoint.

- While this development would have to account for all relevant technology forms, I argue that, at least in the short term, special relevance would have to be given to Computing, Artificial Intelligence, and Information Technologies, for these technologies are going to be fundamental in defining the immediate future of our civilization.

- I argue that academia would have to clearly define and foster the perception of all entities doted with intelligence and sapience comparable to that of the human being as living beings worthy of equivalent rights and obligations to those enjoyed by us. This is of special relevance in what concerns the nature of sapience in regard to the creation of complex Artificial Intelligences, the creation of synthetic organic beings, and the uplifting of animal species through the utilization of Intelligence Augmentation.

- As all of these technologies are extremely complex in nature, I argue that it would be up to academia to create a series of unbiased Virtual Intelligence assistant programs that would help everyday individuals understand and utilize these technologies responsibly without the need to study them in their entirety.

How could academia incorporate the utilization of the new emerging technologies into its own structure?

- In what concerns the general adoption of the emerging technologies into academia, I argue that this is a process that would have to be conducted progressively by the participants of academia itself, taking the teaching of those technologies as a form of language as a foundation from which to conduct said redefinition.

- What concerns the adoption of Artificial Intelligence and Automaton technologies into academia, <u>this is a topic that I have already explored in this chapter</u>[8.2.3], and that will be explored further in the following sub-chapter, in which I will pose and explore the idea of the creation of an Ai powered academic seed as a tool capable of helping our species redefine academia from the ground up.

Once more, I argue that it would not be sensible for me to determine exactly how the teaching of each of these technologies would have to be conducted, as I consider that only those who are well-versed in their nature and use could do so. As it will be up to those individuals to define how everyday persons will understand, perceive and utilize the emerging technologies, I can only hope that they do so in a way that is sensible enough to foster a responsible, critically minded, and knowledgeable use of them.

8.2.5 Aspect IV: *A seed for The World of Tomorrow*

As I have already exposed through this dissertation, If we consider <u>the nature of The Machine at the Crossroads</u>[7.1] and <u>the nature of Contemporary Human civilization</u>[7.3], it would be reasonable to expect that, as the current century progresses and the more severe aspects of the crossroads start to alter the world in significant ways, a very substantial part of the human population will become ignored, if not outright abandoned, by the predominant governments, and organizations of the world, a concept I explored in the chapter titled <u>In Search o Synthetic Gods</u>[7.4]. With the most impoverished populations and countries most likely being the first to be left behind first as a consequence of the characteristics of contemporary economics and politics, and with those population groups composing more than half of the global human population (Deshmukh, 2021), I argue that this scenario would more than likely leave a very significant part of the human population to face the crossroads in an extremely isolated, misinformed and desperate way, causing unprecedented levels of social unrest, armed conflicts, and humanitarian disasters to rise around the entire planet. This development would significantly decrease our chances of sensibly overcoming the challenges posed by the future.

Because of this possible eventuality, I pose the fourth and last aspect of my proposed academic model: the design and creation by a sizable group of sensible-minded academics of an automated and easily replicable academic seed that would encapsulate the essential aspects of a humanist academia into itself. Once seeded into the world, this device would help its users construct a new form of academia and cultural network from the ground up, an environment and foundation from which our species could potentially redefine itself in a way that would be tuned to both our nature and the nature of technology, thus allowing us to solve the crossroads sensibly.

Aside from incorporating the other three aspects I have exposed and explored in this chapter in what concerns what a potentially sensible redefinition of academia would entail, I argue that for this seed to be successful, it would likely have to achieve a series of characteristics. First and foremost, I consider that such a seed would likely have to have both **a merely digital version, and one bound to a small and easy-to-replicate physical object,** so that it could benefit as many individuals as possible. I also argue that, within reason, **such a seed would have to contain an unbiased repository of all human knowledge and history;** as I have <u>previously explained</u>[8.2.2], I consider that such a foundation would be essential to allow the complete development of the individuals that utilize the seed.

I also argue that this seed would have to **be equipped with an in-built set of extensive academic Virtual Intelligences, environments, and tools** that would allow the individual to benefit from most of what academia offers, even in isolation. Lastly, I argue that this seed would have to **incorporate an in-built system that would permit the seamless creation of academic, information, and cultural networks from the ground up in a multitude of ways,** as I argue that such a process would be essential for the sensible redefinition of academia and culture,

as it would allow individuals to create these networks from zero
aside from the preexisting networks.

As this chapter of the dissertation is concerned with academia,
the cultural aspects of this seed will be exposed and analyzed
in the next chapter, which focuses on the topic of culture.

Virtual and physical

- I pose that, in order to be utilizable by as many
  individuals as possible, this academic seed would
  have to be designed and created both as a merely
  digital entity that utilizes the preexisting
  computing and information networks to function, and
  as one that exists as a physical object that also
  encapsulates most of the characteristics of the
  digital one.

- The physical version of the seed would be essential
  to account for those environments and societies that
  do not count on the information and computing
  networks necessary to permit the complete execution
  of its functions.

A universal repository of knowledge

- I pose that this academic seed would have to contain
  a universal repository of human knowledge, which
  would include all forms of knowledge except the most
  dangerous. I argue that this knowledge database would
  be essential for the creation of the seed, as it
  would serve as a foundation from which those who
  utilize it could develop their own skills.

- I argue that the first iteration of this database
  would have to be created in tune with the artistic,

scientific, and democratic mindsets of a
multicultural and multidisciplinary group of sensibly
and critically academics.

- I argue that, after its initial creation, this
database would have to become an ever-growing and
evolving repository of knowledge, with those who
would participate in the academic and cultural
network that would emerge from the utilization of the
seed contributing to it in a critically minded way
that would follow the artistic, scientific and
democratic mindsets.

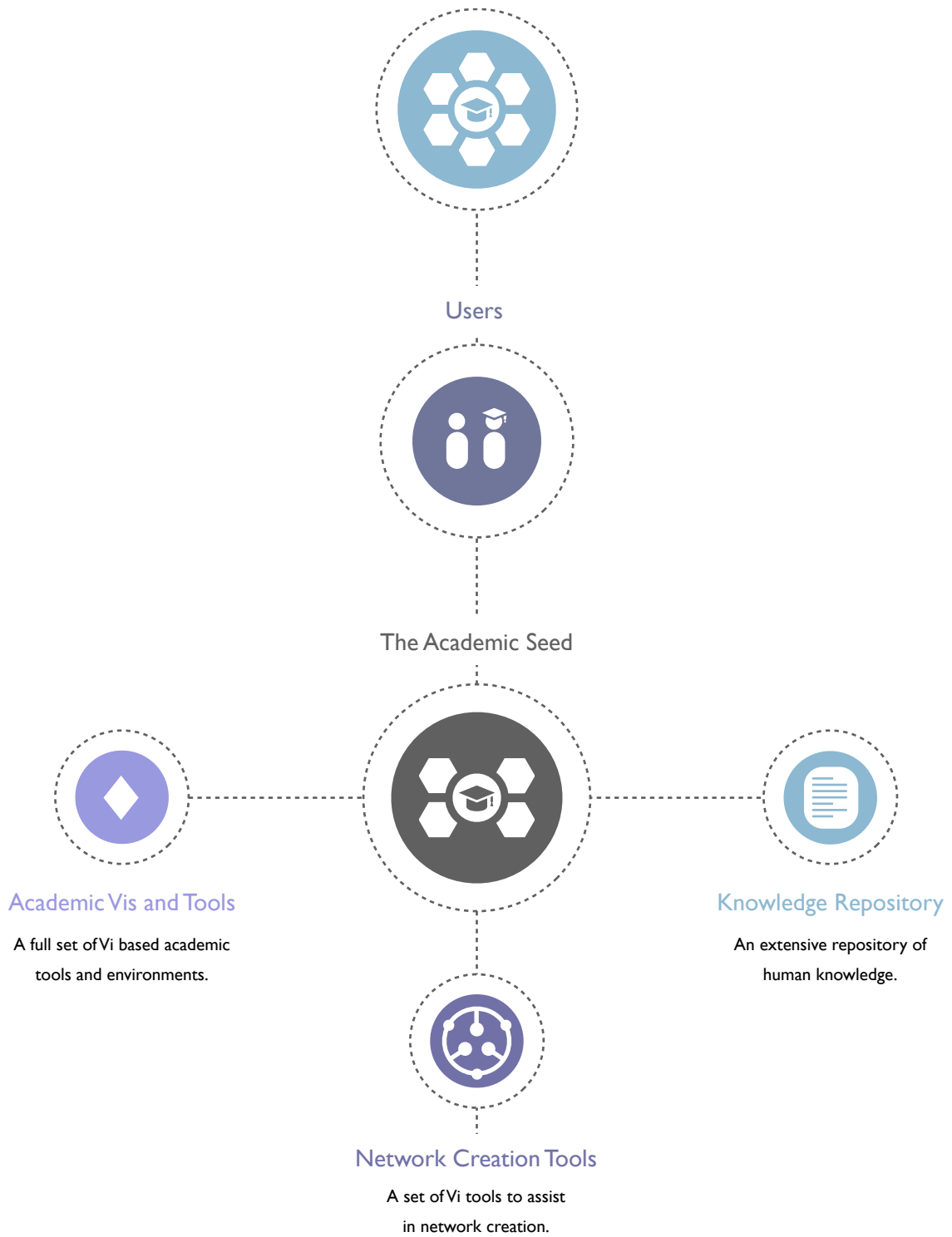**Virtual Intelligence assistants and academic tools**

- <u>As previously exposed in this chapter</u>[8.2.3], I pose
that a seed such as this would require to be equipped
with a complete set of academic tools, environments,
and Virtual Intelligences that would encapsulate a
very significant part of the possibilities offered by
academia without the need for external human input.

- Most relevantly, I argue that aside from the more
traditional Vi systems, this seed would require to be
equipped with a series of Vi assistants designed to
help individuals perceive and adapt to the challenges
posed by *The Machine at the Crossroads*. In essence, I
argue that this would require three types of Vi
programs to be successful: one focused on helping the
individual perceive the Crossroads as a whole,
another one centered on helping the individual adapt
to the crossroads in a practical way that is tuned to
their way of being, and a third one that would help
the individual sensibly perceive and interact with
the new emerging technologies.

- Needless to say, these Vi systems would have to be capable of adapting to the personalities, languages, and cultures of those who utilize them.

Network creation tools

- I pose that this seed would also have to be equipped with a series of tools and Vi programs that would help the individual seamlessly create information and computing networks, as such a development would be essential to permit the creation of emergent academic and cultural networks from the ground up.

- I argue that such a toolset would have to evaluate the computing and networking assets available to those who utilize them and consequently help them utilize those assets to interact with and expand the academic and cultural networks.

- As it is likely that many individuals would not have access to these types of assets by default, the physical version of the seed would have to incorporate in-built wireless networking tools to facilitate the creation of basic information, computing, and communication networks.

The Academic Network

Users

The Academic Seed

Academic Vis and Tools

A full set of Vi based academic tools and environments.

Knowledge Repository

An extensive repository of human knowledge.

Network Creation Tools

A set of Vi tools to assist in network creation.

The academic seed, diagram

I also argue that for this seed to work, it would have to unfold in a progressive way that considers the more fundamental and immediately relevant aspects of an individual's life and their tribal space first, offers the academic process and environment second and gives the tools and guidelines to create academic and cultural networks last. In general terms, and following that pattern, I consider that the seed would have to unfold as follows:

The unfolding of the seed

- Once an individual would have acquired one of these seeds, no matter if the seed in question is a digital or physical version of it the seed would have to analyze the defining characteristics, skills, relationships, and assets of the individual, and evaluate its current state in relation to society and The Machine at the Crossroads, all while introducing itself to its user through a Virtual Intelligence persona that would make the entire process seamless.

- Afterward, the seed would have to help its user overcome its most immediate challenges and threats in a sensible and responsible way by utilizing all its available tools. This phase's main focus would be survivability and cooperation with other individuals.

- In parallel to this process, the seed would have to analyze the tribal space of the individual and evaluate the most significant challenges it faces. By making use of all of its tools, the seed would have to help said tribal space overcome its most immediate challenges sensibly, and would also have to assist its members in gaining access to their own seeds.

- Once all, or at the very least a very significant part of said tribal space gain access to their own seeds, the first stage of this process would repeat in regards to the individuals who compose it. Lastly, the seeds would have to help those individuals create an information network between themselves.

- After said network is created, each seed would have to conduct a thorough academic evaluation of its user and would have to offer them access to a complete academic process that follows the tenets exposed in this chapter, one that is tuned to their personality and goals.

- Once the most personal aspects of academia become defined, the seeds would have to help their users create an academic network among all the members of the tribal space, thus helping them create academia tuned to their combined culture, experiences, necessities, and goals.

- In parallel to this development, the seeds would also have to help their users create a social and cultural network among themselves, hoping they define the identity and culture of their tribe.

- I argue that both networks would have to be created by exercising the democratic process and mimicking the structures that define tribal spaces, with implies that both networks would have to be composed of individuals organizing into groups of different sizes, with the disciplinary focus and emotional connection displayed by each group becoming less significant the larger the group, but with each individual being a part of more than one group at a time (e.g. a couple, a group of three friends, a family, a small research group, a professional

group). Ultimately, I argue that the maximum size of
the network would have to be no larger than a couple
of hundred individuals, as going beyond that number
would prevent its members from sensibly perceiving
everyone else in the group.

- In parallel to this process, the seeds would have to
  instruct their users in regards to the nature of *The
  Machine at the Crossroads* and start to educate them
  in the nature of the new emerging technologies,
  presenting and teaching them as languages, so that
  they might make a more sensible use of them.

- As it would not be feasible for most individuals to
  learn the language and structures that define those
  technologies in full, from this point onwards, the
  seed would have to serve as an intermediary between
  its user and the emerging technologies through Vi
  personas.

- In what concerns culture, after the tribal space is
  clearly defined culturally and academically, the
  seeds would have to help their users create a series
  of automated systems and Vi personas that would
  encapsulate their combined culture and goals, with
  one Ai system being created for each aspect of the
  tribal space, with a centralized one organizing the
  entire network. These systems would need to make use
  of their own computing systems, as they would be more
  complex than the Vis that composed the seeds.

- Afterward, these AI systems would help the tribe
  interact with the world at large, guiding them
  against the crossroads and assisting them in the
  creation of more complex networks, a topic that will
  be explored in detail in the next chapter.

- In what concerns academia, the seeds would have to help their users create academic Ai systems, spaces, and networks capable of contacting and interacting with the rest of the world in an emergent way, allowing them to both expand the academic aspect of their specific tribe and to create specific academic groups that exist aside from their original tribal space, helping them create a sensible worldwide academic network from the ground up.

- Lastly, the seeds would also have to assist their users in creating and seeding newer generations of academic seeds, so that these seeds might eventually reach every single individual in the world.

- At this point, the initial role of the seeds would be concluded, with them remaining as assistants of their users and their tribes indefinitely.

These aspects constitute the essential parts of what I consider an academic seed would require to be successful in fostering a sensible academic and cultural redefinition from the ground up. As I have previously argued, the more specific characteristics of this seed would have to be determined by a sizable group of sensible academics, as designing such a system in detail escapes the focus of this dissertation. How the seeds exposed in this chapter could give birth to more complex networks capable of helping us redefine our civilization in face of the crossroads will be explored in the next chapter of this dissertation.

8.2.6 An Emergent Academia for the Future, Conclusions

What the world of tomorrow might hold for academia, and what academia might give in return is probably something that only time can reveal, for the nature of <u>The Machine at the Crossroads</u>[7.1] is too unpredictable for us to determine how the academic institutions will react to the changing world and the challenges posed by the future. However, as I exposed in In <u>An Automaton Factory</u>[7.3.3], It can be argued that if contemporary academia doesn't grow beyond its traditional structure and adopts a more humanist approach to education and research, it would be reasonable to expect that academia will become completely unable to help our civilization adapt to and eventually overcome the challenges posed by the crossroads, for it would become overwhelmed by it.

In this chapter I have exposed, taking my previous analyses and the work accomplished by the experimental humanist academic institutions such as <u>The Black Mountain College</u>[6.6] as a basis, the ways through which I believe contemporary academia could sensibly redefine itself, taking into consideration the nature of our species, the nature of civilization the nature of technology and our relation towards it, and the nature of the crossroads, so that academia might become an environment and tool from which a sensible redefinition of our species and civilization could occur in the face of the crossroads. As a concession to this chapter, I will now overview the key points exposed in it.

My postulates for a sensible redefinition of academia in the face of the crossroads

- I argue that academia could play a key role in helping our civilization redefine itself sensibly from the ground up in the face of the crossroads and that such a redefinition could help us overcome the challenges posed by the future without having to compromise or abandon our humanity in the process.

- To this end, I argue that academia itself would have to undergo a systematic redefinition on a worldwide scale, a redefinition that would have to be founded on secular humanistic principles and that would have to account for every single individual on the planet.

- For academia to become capable of helping our species reconfigure itself in the face of the challenges posed by the future, I argue that it would have to directly tackle and mediate between the defining characteristics of both our species and the crossroads. Therefore, it would have to account for the tribal nature of our species, the nature of technology, the nature of human civilization, and the nature of the crossroads itself.

- To accomplish that goal, I pose that academia would have to embrace, both as a defining characteristic of its structure and as something to be fostered by the general population, the secular humanist principles, the artistic, scientific, and academic mindsets, and the sensible understanding and utilization of technology.

- Lastly, I argue that contemporary sensible-minded academics should cooperate to define and create an automated academic seed from which a broader and far-

reaching redefinition of academia, and an eventual

sensible redefinition of our civilization could

emerge.

I have exposed these ideas more as guidelines than as concrete postulates, as I believe that the conduction of a sensible redefinition of academia would require the cooperation of participants from the entirety of the contemporary academic world. To that end, I hope that what I have posed in this chapter proves to be useful to those who undertake such an endeavor.

8.3 Postulate III: Culture and Emergence

Culture is an exceedingly complex topic, as it concerns the whole of our species and the entire history of human civilization. There is much that could be said about the state of contemporary culture, some of which I already exposed in **A Deafening Silence**[7.3.5], but I argue that it would not be feasible to determine how culture should evolve in the coming decades to help our species redefine itself in the face of *The Machine at the Crossroads*, for culture is, arguably, an emergent behavior, and therefore can not be directly defined as one would define the artistic or academic institutions. In fact, I argue that, at least to a large degree, it is precisely by defining how the artistic and academic disciplines could sensibly evolve in the face of the crossroads that we can indirectly cause a sensible redefinition of culture, as those disciplines would influence the individuals from whom culture would emerge.

Therefore, if we can not directly determine how culture should evolve, and with my artistic and academic postulates already completed, what remains to be said in this chapter? We still have to discuss two of the most fundamental aspects of what defines culture, and how reshaping those aspects in tune

with the nature of emergent behaviors could potentially help us overcome the crossroads: its relation to the environment, and its relation to human organization and communication. However, there is an important disclaimer that I feel is vital to make before I address those topics.

As I previously exposed[7.1.6], my research into the nature of the human civilization and the nature of evolutive emergent behaviors has unveiled that there are striking similarities between both, raising the question of if the human civilization could cause such an event to come to be, and whether it would be positive or detrimental to us. I pose that if the aspects that define culture were to be redefined sensibly and in tune with the structures that compose positive evolutive emergents, the likelihood of such an event occurring in a positive way that would benefit the whole of our species would increase dramatically, potentially giving birth to an emergent conscious mind various orders of magnitude more complex and intelligent than humans, but that would have the best interests of our civilization at the hearth. I argue that such a mind would significantly increase our chances of sensibly overcoming the crossroads, for it would permit our civilization to coexist with artificial superintelligences and post-human beings. However, I argue that, even if such an emergence was not to occur, this redefinition would help us create a more humane form of culture, a development that would be beneficial to our species on its own.

However, as the studying of evolutive emergence is still a very young research field[5.3.2], I argue that I can't elaborate on a foundational framework solid enough to construct my cultural postulates. Therefore, and as the conduction of further research into these topics would go far beyond the scope of this dissertation, I will instead propose potential interdisciplinary research projects that could contribute to the fields of evolutive emergence and cultural studies at the same time.

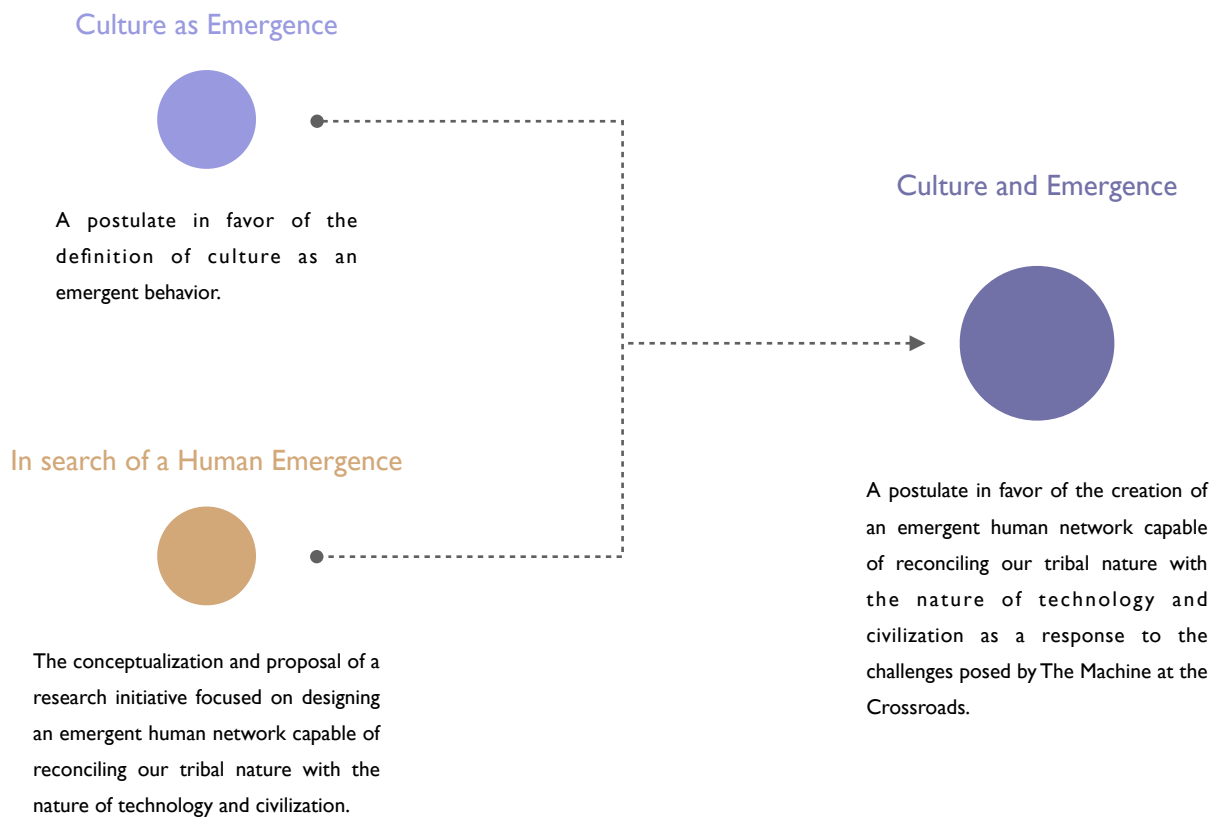**What research questions does this chapter address?**

- This chapter will propose further research into the fields of evolutive emergence and cultural studies to determine if human interaction and culture could cause an evolutive emergence in the context provided by *The Machine at the Crossroads*. Therefore, this chapter addresses all my ***Contextual overlaying questions***[3.5.3] and ***Core Research Questions***[3.5.5]:

- Can life and intelligence be explained as weak emergence? Which ones are the different scientific opinions in this regard? Can consciousness be explained as weak emergence? Which ones are the different scientific opinions in this regard?

- What are the factors that trigger evolutive emergent behaviors from the interactivity of simpler systems?

- Can human social structures be understood as emergent behaviors?

- Could human interaction trigger an evolutive emergent behavior? Could such an emergence be positive or negative?

- Would it be possible to create cultural, artistic, academic, and scientific interdisciplinary networks that mimic the structures capable of generating positive emergent behaviors?

- In which ways could education and academia help us make more responsible and equitable use of the new emerging technologies? In which ways could education and academia help us face the challenges of the future? How could education and academia adapt to the world of tomorrow sensibly?

- In which ways could culture help us make more
  responsible and equitable use of the new emerging
  technologies? In which ways could culture help us
  face the challenges of the future? How could culture
  adapt to the world of tomorrow sensibly?

- In which ways could art help us make more responsible
  and equitable use of the new emerging technologies?
  In which ways could art help us face the challenges
  of the future? How could the artistic disciplines
  adapt to the world of tomorrow sensibly?

- How could we make the cultural, artistic, and
  academic disciplines and institutions more appealing
  and accessible to the general population?

- Is it possible for a non-imposing universal human
  culture to exist? How could such a culture be
  created? Would such a culture be beneficial to human
  civilization?

- How could we create a universally accessible digital
  environment capable of synergistically integrating
  the cultural, artistic, academic, and scientific
  disciplines? Would shaping such a network in the form
  of an emergent network benefit human civilization?

What subjects will this chapter explore?

- The definition and understanding of culture in the
  context of the history of our species and the
  crossroads, and the underlining of its essential role
  as an emergent behavior of the human civilization.

- The proposal of a research project concerned with the
  nature of evolutive emergent behaviors in the context

of the potential application of their defining structural patterns in human organizational and communicational structures, with the goal of fostering a sensible cultural renaissance that could potentially contribute to the occurrence of a positive evolutive emergent caused by human behavior and interaction.

Culture as Emergence

A postulate in favor of the definition of culture as an emergent behavior.

Culture and Emergence

A postulate in favor of the creation of an emergent human network capable of reconciling our tribal nature with the nature of technology and civilization as a response to the challenges posed by The Machine at the Crossroads.

In search of a Human Emergence

The conceptualization and proposal of a research initiative focused on designing an emergent human network capable of reconciling our tribal nature with the nature of technology and civilization.

Culture and Emergence, outline

8.3.1 From us, for us: *Culture as Emergence*

As I argued in the introduction to this chapter, it would not be feasible, and much less so sensible, to attempt to conduct a complete analysis and evaluation of what culture entails, for, arguably, **culture concerns all that we have been, all that we are, and all that we could be as a species and civilization.** Culture emanates from each individual, from how each of us perceives, interacts with, imagines, and remembers the world and each other. It is defined by how the environment shapes us, by how we socialize and interact with each other, and by how we organize ourselves into societies, a process that has given birth to the uncountable different cultures that have doted the world through our history. In return, those cultures have defined us back, strengthening and diversifying the human civilization when the environmental conditions have allowed for it while contributing to stagnation or decay otherwise[7.2.2].

Cultural studies have always attempted to analyze and expose what culture is, and while they have arguably been successful in studying the many different aspects and disciplines that define it, both in a universal and region-specific way, **I argue that they have never been able to provide a complete understanding of what culture truly entails.** I argue that there are many factors that have contributed to this, chief among them being the impracticality of conducting a continuous study of the entirety

of human activity, but I also argue that there has been another very significant, if insidious, cause: the lack of a unified theoretical lens from which to explore culture, a lens that could focus our understanding of the different aspects of culture, and the nature of each of the cultures that compose the human civilization, into a complete and unbiased model. But which one could that lens be?

To answer that question, **I pose that culture can be understood as an emergent behavior of the human civilization** and that by studying and framing it through such a lens we could potentially manage to comprehend it in a way that manages to perceive all of its constituents in a complete, synergic and sensible manner. The study conducted by *Christopher K. Tokita and Corina E. Tarnita* (Tokita and Tarnita, 2020) in regards to the emergent nature of human social and organizational structures serves as a base for this definition, for this study unveils that those structures, which are a clear defining aspect of all cultural forms, behave similarly to naturally occurring evolutive emergent behaviors[5.3.2.2]. While this analysis focuses solely on studying the emergent nature of social and organizational structures, I argue that it provides a foundational framework from which we can frame culture as an emergent behavior.

Culture as an emergent behavior

- All the aspects that define culture emanate from the interactions of human individuals with the environment and with each other. In return, culture establishes a feedback loop with human society, stabilizing and defining it in a non-imposing way.

- Human interaction and organization tend to become more complex in response to environmental changes,

social progress, and technological development. This
process is achieved through social organization, with
the cooperation of simpler social forms giving birth
to more complex and capable societies and cultures in
a scalar way that defines the entirety of the human
civilization, from the smallest of groups being
formed by the cooperation of a handful of
individuals, to entire societies being composed by
millions of individuals who are themselves organized
into a scalar system of groups and disciplines.

- Each of these organizational groups is formed only
  when the environmental conditions and organizational
  complexities needed to provoke their emergence
  materialize for a significant amount of time, and
  such processes are always tuned to said environmental
  conditions. As exposed by *Jared Diamond* in his book
  Guns, Germs, and Steel: The Fates of Human Societies
  (Diamond, 1999,p. 85-239)[10.3.1.18], this explains why
  the different human cultures and civilizations that
  have defined our history so far have evolved in
  different ways and with different identities, with
  those environments more adequate to promote cultural
  and technological emergences giving birth to the most
  advanced civilizations of the world.

- Each significant cultural emergence displays novel
  social and organizational behaviors that permit
  societies to perform tasks they were unable to
  perform beforehand, a process that is closely tied to
  the development of technology. Similarly, each
  significant cultural emergence stabilizes their
  societies, keeping them from regressing to simpler
  forms.

- I argue that these factors, on their own, prove that culture can be considered an emergent behavior, and that, consequently, can be analyzed as such.

However, I also argue that culture has a very significant difference when compared to less complex emergent structures, **that it is shaped by the actions and interactions of billions of intelligent beings doted of free will**, with their individual actions and behaviors having the potential to impact the cultural and social structures they are part of in extreme ways, for better or worse. While nature demonstrates that evolutive emergents of a specific evolutive level tend to become the composing aspects of even more complex evolutive emergents (Feinberg and Mallatt, 2020), we still have no significant information, aside from the evolutionary history of the human culture and civilization, that displays how emergent systems composed by fully self-aware and intelligent beings tend to organize, and whether if more complex self-aware emergent systems can result from their interaction or not.

From what we can determine from the history of our species, I argue that we can at the very least conclude two things: on the positive side, we can conclude that, when the appropriate environmental and organizational conditions are met, **the extreme diversity of behaviors and ideas that emanates from the many individuals that compose human civilizations provokes a cascade of innovative emergent behaviors that are unprecedented when compared to the novel behaviors developed by less complex systems.** On the negative side, **we can conclude that the hierarchical nature of our traditional organizational structures exists in tension with the emergent nature of culture**, as a consequence of having been unable to reconcile our tribal nature with the nature of technology and civilization.

At odds with itself

- I argue that the emergent nature of culture and social organization is at odds with the limitations imposed by our tribal nature, which prevent human individuals from sensibly perceiving and interacting with groups and environments that are more complex than tribal environments. I argue that this factor, summed to the extremely hierarchical nature of traditional social structures, disrupts the emergent nature of culture and society past the tribal stage because a single influential individual can redefine culture and society while still being limited by those factors.

- This structure also significantly limits the input of most of the human populace in what concerns the behavior of culture and civilization, with those individuals becoming mere executors of the will of those who occupy higher positions on the hierarchies than them, curtaining and voiding ideological and behavioral diversity in a very significant part.

- Technology is essential to cultural and societal emergence and progress, for it permits individuals to grow past the limitations imposed by their tribal minds. However, our continued inability to reconcile the exponentially evolving nature of technology with our tribal nature through hierarchical specialization creates an escalating tension that could potentially lead to a technological overload. I argue that this tension further disrupts the emergent nature of culture and civilization, as it progressively leads to a state in which the composing aspects of the emergent become unable to interact with the environment they are part of, eventually leading to a systemic collapse.

This is a topic that I have explored in detail through this dissertation, as I have exposed the underline tribal nature of our species [7.2.3], the flawed relation we have developed with technology as a consequence of being unable to properly recognize said nature [7.1.5], and the many pitfalls that have grown to define our civilizations and cultures over time as a consequence of our inability to reconcile one with the other [7.3]. In this context, I argue that the framing of culture as an emergent behavior, and the exposition of the many flaws that have defined it through the history of our species, permits us to understand these factors in a complete manner, while also offering us a way to discern a possible solution to all of these problems, which we can organize in a series of clear hypotheses.

An emergent culture as a solution

- I hypothesize that by analyzing the nature of culture and human organization as emergent behaviors, and by utilizing said knowledge to conduct a sensible redefinition of the many aspects that define human culture, communication, and organization in tune with humanist principles, the demand for sensible diversity set by the laws of natural evolution and natural selection, and the organizational structures that define naturally occurring evolutive emergents, we could foster a cultural, communicational and organizational renaissance capable of helping our species reconcile its tribal nature with the nature of technology and that of civilization, thus permitting us to overcome The Machine at the Crossroads sensibly.

- I argue that this would be accomplished by virtue of the emergent nature of the system, which would allow all of its constituents to establish a synergic

relationship with each other: individuals would be able to organize themselves and communicate with each other in a way that is aware and respectful of their tribal limitations thanks to the utilization of the emerging technologies, while the emergent structure of the system would theoretically establish a stabilizing feedback loop between the whole of the system and its constituents which would permit a progressive and scalar expansion of the network.

- In what concerns human organization, this would imply adopting social, communicational, and organizational structures that are tuned to our tribal nature and the nature of emergent systems, and that incorporate the utilization of the new emerging technologies into themselves. In general terms, this would necessitate the adoption of a scalar and largely non-hierarchical form of social organization and communication where the largest concrete social and cultural group is similar in size and composition to a tribe (Diamond, 2013), as any group larger than that would get into conflict with our tribal limitations[7.2.3], and where larger group structures are only constructed and interconnected through the utilization of the new emerging technologies and emergent networking.

- In what concerns the nature of emergent networking and communication, this would imply that human communication and organization would have to be attuned to the nature of emergent systems[5.3.2], especially in what concerns emergent social organization[5.3.2.2].

- In what concerns the relation between our species and technology, I argue that by sensibly incorporating the new emerging technologies into an emergent

cultural and social structure that emerges from human activity and from the usage that humans make of said technologies to outgrow their limitations, the nature of technology would finally be reconciled with that of our species, as they would both become defining aspects of an emergent system that would establish a stabilizing feedback loop with them both, which would synergize their relationship and keep them from disrupting or overcoming each other.

- Most relevantly, I argue that the sensible utilization of these technologies, and especially of the emerging communication and artificial intelligence technologies, as extensions of the individuals themselves and as aspects of an emergent network, would allow humans to, directly and indirectly, expand their perceptive, social and organizational capabilities beyond the limits imposed by their tribal nature and mind without compromising their perception and interaction with the world as the traditional usage of technology and hierarchical organization has.

- If we account for the potential creation and emergence of sapient synthetic beings, no matter if these beings are biological or cybernetic in nature, I argue that this emergent network would help them seamlessly become a part of our civilization, for they would become a defining aspect of such a network as much as humans or technology systems would. Ultimately, I argue that this would be one of the few ways through which our civilization could evolve into one composed of many different sapient beings because, as the history of our species demonstrates (Diamond, 2013), It is likely that our tribal nature

would keep us from being able to sensibly integrate those being into society otherwise.

- Ultimately I argue that thanks to the emergent nature of this cultural model, its seeding and prolonged development would eventually lead to the formation of a worldwide cultural environment composed of an extremely diverse amount of specific cultures organized in a scalar level of complexity that would nevertheless be able to coexist and cooperate with each other, no matter their nature or origin as long as these cultural groups are sensible enough, thanks to the emergent nature of the network, with smaller social groups being networked to others in emergent ways to form larger social groups. I pose that the prolonged utilization of this model would allow for the eventual emergence of a universal culture that would be a sensible representation of all human cultures, as it would emanate from the participation of all human beings worldwide, and it would form itself in a way that would allow all specific cultures to coexist with the broader model without being diluted into it.

- I pose that this cultural model would be a direct response to the need for a universal and sensible form of culture that manages to avoid the pitfalls associated with globalized culture.

- In what concerns the potential emergence of a human-caused evolutive emergent mind, as I exposed in _The Mind of Civilization_[7.1.6], I hypothesize that a redefinition of human culture and organizational structures conducted in tune with what is exposed in this chapter would significantly contribute to such a mind being a sensible incarnation of the human

civilization, as it would directly emerge from the perceptions, actions, emotions, and thoughts of every single sapient being and technological system in the network. I argue that such a mind would undoubtedly have the best interests of our civilization at hearth and that it would undoubtedly help us overcome the crossroads and venture into the future, while also permitting us to discover, interact and benefit from the universe in ways that we could not even imagine, for it would be many orders of magnitude more intelligent than us.

- I hypothesize that in the extreme, if possible, scenarios of a technological singularity occurring, of a part of a civilization achieving post-humanity, or of our civilization encountering an alien post-singularity entity, such a mind would permit our civilization to interact and coexist with such entities seamlessly, as it would serve as an intermediary between those entities and ourselves.

- As I exposed in *The Crossroads*[7.1.5] and in *The Mind of Civilization*[7.1.6], I argue that this would likely be the only path that would permit the three most significant outcomes of crossroads to coexist, with the emergent mind fulfilling the role of mediator between them.
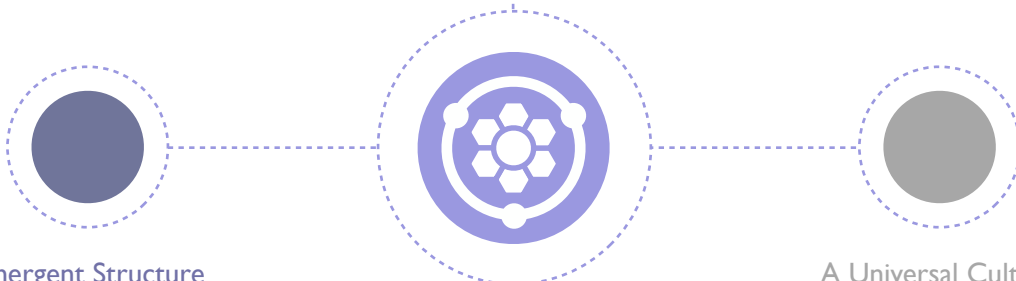
The Human Being

Our Tribal Nature

Emergent networking and automation help us grow beyond our tribal nature without causing perceptive dissonance.

Cultural Diversity

Culture would be defined in an emergent way, increasing cultural diversity worldwide in a sensible manner.

An Emergent Cultural Network

Emergent Structure

The emergent nature of the network would reconcile our tribal nature with the nature of technology.

The network would stabilize our civilization and help us overcome the crossroads.

A Universal Culture

The emergent network would give birth to a universal human culture that would not impose itself over specific cultures.

Technology

The Nature of Technology

The emergent nature of the network would permit the sensible utilization and administration of technology.

Academic Synergy

The academic aspect of the network would encourage the sensible development and utilization of technology.

An emergent cultural network, diagram

Exploring this topic in more detail would far exceed the scope of this dissertation, as it is evident that a very significant amount of research work would have to be conducted to address these hypotheses in a substantial way. Therefore, in the next sub-chapter, I will conceptualize such a research project as a conclusion to this chapter.

8.3.2 Between apes and synthetic gods: *In Search of a Human Emergence*

What would research concerned with addressing my hypotheses regarding the emerging nature of culture would entail? How could we utilize the knowledge generated by said research to foster a sensible redefinition of culture and human organizational structures in tune with the humanist principles and the nature of evolutive emergent behaviors? To expose what this research initiative would have to accomplish, first and foremost we have to lie out the research questions it would have to answer:

In Search of a Human Emergence: **Research Questions Concerning the Emergent Nature of Culture**

- What parallels can be established between the organizational structures that define naturally occurring emergent systems and human cultural, organizational, and communicational systems?

- Can human culture and society be defined and understood as an emergent system?

- Could such a definition be utilized to construct a research framework that could be used to elaborate a complete and integrative understanding of culture and

all of its constituents, with culture being the emergent behavior that stems from said constituents?

- Could such an understanding allow us to foster a sensible redefinition of the human cultural, communicational and organizational systems and disciplines in tune with the nature of naturally occurring emergent systems and the limitations imposed by our tribal mind?

- How would such a redefinition interact with the new emerging technologies, and especially with Artificial Intelligence and Communication technologies?

- As long as the artistic and academic disciplines had been sensibly redefined beforehand, could a redefinition such as this manage to reconcile the tribal nature of our species with the ever-evolving nature of technology and the behaviors that define the natural world?

- If we consider that the fostering of any kind of emergent system requires an indirect approach, would it be appropriate to create a cultural seed in the vein of my posed academic seed[8.2.5] that, when entrusted to the general population, could lead to a sensible redefinition of human cultural, communicational and organizational structures occurring progressively?

- Would a redefinition such as this be positive for human civilization? Would it help us overcome the challenges posed by the future?

In Search of a Human Emergence: Research Questions Concerning the Potential Occurrence of a Human-Caused Evolutive Emergent

- Could an evolutive emergent mind come to be as a consequence of human and human-caused interaction and organization reaching a critical complexity mass in the foreseeable future, and of said mass being stimulated by the challenges posed by *The Machine at the Crossroads*?

- In what concerns that possible scenario, would a successful redefinition of human culture in tune with the nature of evolutive emergent systems help such a mind be sensible and act with the best interests of the human civilization at heart?

I argue that this research project would have to be conducted in three phases: **a first phase** dedicated to the analyzing and contrasting the nature of evolutive emergents with that of culture and the cultural disciplines, with the goal of reframing the later as an emergent system, **a second phase** dedicated to conceptualizing and elaborating a cultural seed system that could, alongside the conduction of a sensible redefinition of the artistic and academic disciplines, lead to a redefinition of human cultures and organizational structures in tune with the nature of evolutive emergent behaviors as a way to reconcile our tribal nature with the nature of technology and civilization, and **a last open-ended phase** that studies the possibility of an evolutive emergent mind coming to be from human interaction during the machine at the crossroads, with the goal of fostering sensible cultural practices that could, in the case of such an entity becoming a reality, help it become a well-formed, stable, humane and responsible being.

Research Phase I: Culture as Emergence

- This first phase of the research project would entirely focus on reframing the studying and understanding of culture and its constituents as an emergent system by contrasting their nature with that of evolutive emergent systems.

- In this phase, it would be necessary to analyze and contrast the defining characteristics of naturally occurring emergent systems and human-generated cultural and organizational structures.

- While the former can be considered a relatively narrow field of study, the addressing of the latter would likely require a very extensive analysis of most of the disciplines and aspects that define the human civilization, and would therefore demand an interdisciplinary approach to its studying, an approach that would likely necessitate the creation of an international research group formed by a plethora of individuals that manage to sensibly represent those disciplines, either directly by becoming dedicated members of the research group, or by indirectly contributing their experience as consultants.

- However, If we consider the emergent nature of culture, and the progressively evolving nature of the feedback systems that emergent behaviors <u>establish with their constituents</u>[5.3.2] when defining emergent systems, we can determine that a study such as this would have to be especially focused on the foundational, communicational and organizational aspects of culture and society, those aspects being the fields of academia, communication, and organization respectively.

- I argue that, if this phase was to be successful, the information provided by it would contribute very significantly to the elaboration of an academic framework from which a unified understanding of the cultural practices could be achieved through the reframing of culture, and of all of its constituents, as a unified emergent system. In turn, this process would also provide the knowledge base necessary to conduct the second phase of the research project.

Research Phase II: **An Emergent Cultural Redefinition**

- The second phase of the research project would be focused on utilizing the knowledge provided by the first phase to conceptualize and foster a redefinition of the human cultural disciplines in tune with the nature of emergent systems, and would therefore be an extension of said first phase.

- In this phase, the research group would have to devise how the entirety of the human cultural disciplines could be redefined in a progressive and emergent way in tune with the nature and structures of emergent systems in a way that would allow said disciplines to reconcile our tribal nature with the nature of technology and that of civilization, a concept I previously exposed in this chapter[8.3.1].

- The end goal of this stage would be to design a set of cultural, communicational, and organizational networks and tools, not too dissimilar from the ones I posed through my academic postulates[8.2.5], that would, once entrusted to the general populace, foster a redefinition of the cultural disciplines in tune with the nature of emergent systems in a progressive way

that would emanate from each individual. Needless to say, and as I exposed in both my artistic and academic postulates, this process would have to account for the necessity to sensibly integrate the emerging technologies, and especially artificial intelligence technologies, into this form of cultural network.

- Most relevantly, I argue that it would have to find a way to synergize the tribal nature of the human mind with the nature of artificial intelligence systems, <u>by encouraging individuals to sensibly utilize said technologies, and emergent networking, to grow past their tribal limitations</u>[8.2.4]. To this end, I argue that the research group would have to design a social, communicational, and organizational network system that would encourage individuals to organize themselves into a system of scalar groups that respect the tribal limitations of the human mind, while also giving them knowledge and tools necessary to create Artificial Intelligence and communicational systems that would permit them to grow past those limitations sensibly through the utilization of emergent networking.

- As the actual culture would emanate from the individuals themselves, with this network only providing them with the environments and tools necessary to do so sensibly and in tune with the nature of emergent systems, the success of this venture would necessitate that a sensible redefinition of the academic and artistic disciplines would have been conducted beforehand, for I argue that the general populace would not manage to make positive use of this network otherwise, <u>as the contemporary educational, cultural and communicational disciplines demonstrate</u>[7.3].

- As the continued creation of the network itself would be entrusted to the general populace, I argue that the research team would have to make a significant effort in designing it in a way that makes it foolproof and easy to use. I argue that this network would have to be doted of <u>Virtual Intelligence assistants</u>[8.2.4], as these tools would guide individuals in creating and utilizing it.

- This phase would have to culminate with the designing and creation of a system seed, <u>similar in concept to my posed academic seed</u>[8.2.5], that would contain the foundational aspects of the entire cultural network. Once created in enough quantities and seeded into the world, this system would allow individuals to progressively create an emergent cultural network which would lead to a complete cultural redefinition.

- From this point onwards the research project would have to progressively evaluate the evolution of the emergent cultural network, indirectly contributing to its formation through the iteration of newer system seeds and updates. However, I argue that the research group would have to avoid making significant changes to the network, as that would disrupt its emergent nature. It would fall back to those who utilize the network to create, expand and update it.

- Theoretically, if the cultural network was successfully fostered in tune with the nature of emergent systems, it would progressively grow into a self-stabilizing and improving state, as the many individuals and groups that would form it would establish a positive feedback relation with the whole network while still remaining largely independent from each other if they so desired.

- Consequently, I argue that the cultural form that would emerge from the utilization of this network would likely be extraordinarily diverse and harmonious at the same time. The emergent nature of the network would allow specific cultures to flourish and prosper alongside each other, as the universal emergent human culture they would indirectly shape would create positive and non-assimilating feedback loops between them.

- What is more, I argue that this form of culture would offer a synthesis of the national and globalized cultural models, because it would allow individuals to identify with and be a part of both their respective unique cultures and a universal culture. In this regard, the emergent nature of the network would be fundamental, for it would allow every single human being to directly and indirectly contribute and benefit from the universal culture without having to renounce their core cultural identity.

- Moreover, I pose that the successful emergence of a cultural model such as this would likely contribute significantly to the reconciliation of the many mindsets that define our civilization, which could be vital to preventing the western and eastern cultures from starting a large-scale ideological confrontation.

- Ultimately I argue that, In the context of the crossroads, this is an extremely desirable form of culture to foster, as it would likely boost innovation and social stability to unprecedented levels.

- I also pose that, after the initial seeding of the system, the research group would have to concern itself with the incorporation into the cultural network of those synthetic and emergent lifeforms that

might come to be or be created as the century progresses forward, as this would be essential for the continued wellbeing and evolution of an emergent form of culture.

Research Phase III: A Human-caused Evolutive Emergent

- This last phase of the research project would be concerned with the continued evaluation of the possibility of an evolutive emergent mind forming in the foreseeable future as a result of human activity reaching a sustained critical mass, and of said critical mass being stimulated by the events provoked by The Machine at the Crossroads.

- The purpose of this phase would be to progressively and indirectly update the cultural network fostered in the second phase in response to this evaluation, with the goal of, if such a mind was to truly emerge, <u>helping it define itself as a responsible and sensibly entity that would be beneficial to the whole of our species</u>[7.1.6], especially in the context of _The Machine at the Crossroads_.

I argue that, because of the extremely experimental nature of the topics this research project would be concerned with, it would be unreasonable for me to pose it beyond what I have already exposed, as its complexity far exceeds the focus of this dissertation and my knowledge of the topics at hand. However, **I argue that my research as a whole exposes both the necessity for such a project to be realized, and the foundational knowledge from which to conduct it,** and that, therefore, if it was to be conducted, this new research project could be considered a continuation of this dissertation.

8.3.3 Culture and Emergence, Conclusions

●——————●|

How culture might evolve in the coming decades, especially in the face of the challenges posed by <u>The Machine at the Crossroads</u>[7.1], will likely remain a mystery until those events start to unfold. However, considering my analysis of contemporary <u>culture</u>[7.3.5], <u>art</u>[7.3.4], and <u>academia</u>[7.3.3] in the context of the crossroads, I argue that we can at least venture to say that if no immediate preemptive action is taken to attempt to foster a sensible redefinition of our academic, artistic and communicational disciplines, the cultures that might emerge in the foreseeable future will be completely disconnected from the realities of the world, which would more than likely compromise our ability to overcome the crossroads.

Through my <u>artistic</u>[8.1] and <u>academic</u>[8.2] postulates, I have explored how those two disciplines could potentially be redefined in a sensible way capable of helping us reconcile ourselves with our tribal nature and the nature of technology and civilization, a development I argue would be essential for the successful overcoming fo the crossroads. Taking those postulates as a basis, this chapter conceptualized how the nature of culture could be reinterpreted as an emergent system, and how said knowledge could be utilized to design a cultural network that, when entrusted to the general populace, could foster an extremely diverse cultural renaissance capable of completely synergizing all the aspects that constitute the human civilization, which could potentially give birth to a universal and emergent form of culture that would establish a synergic and non-assimilating relation towards them, thus encouraging cultural diversity and stability at the same time, and ultimately offering a worldwide cultural model capable of avoiding the shortcomings of contemporary globalized culture.

This chapter has concluded with the proposition of a research initiative that, taking this dissertation as a foundation, would explore these concepts in great detail with the ultimate goal of designing such an emergent cultural network. In parallel to that goal, I also posed that such a research initiative would also have to be concerned with evaluating the possible occurrence of an evolutive emergent mind forming as a consequence of human activity reaching a critical complexity mass in the period defined by The Machine at the Crossroads, with the goal of defining how an emergent form of culture could help such an entity form itself in a sensible way that would have the best interests of our civilization at the hearth, thus helping it become an intermediary between our civilization and the most extreme potential consequences of the crossroads.

My postulates for an emergent form of culture

- I pose that the entirety of the cultural disciplines could be reframed as an emergent system, and that said redefinition could help cultural studies develop a complete and integrative understanding of culture.

- I pose that such an understanding could be utilized to design an emergent cultural and social network that, if entrusted to the general population, could foster a cultural renaissance that could help our species reconcile and synergize all the defining aspects of the human civilization, especially in what concerns the relation between our tribal nature and the nature of technology.

- In what concerns the potential scenario of an evaluative emergent mind forming from human-related interaction reaching a critical mass, and of said mass being sufficiently stimulated by the events

provoked by *The Machine at the Crossroads* in the
foreseeable future, I argue that the fostering of a
sensible emergent form of culture could very
significantly contribute to said mind forming as a
reasonable entity that could help our species
overcome the crossroads and face the future beyond.

- I pose that a research initiative should be conducted
  to study and develop these topics, as I argue that
  they are of critical importance if we are to overcome
  The Machine at the Crossroads sensibly.

9 Conclusions
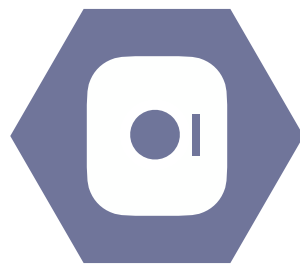
9.0 Introduction to Conclusions

This section of the dissertation contains a final concise evaluation of the entirety of the research project, conducted by contrasting the results of the developmental chapters with the initial research questions[3.5], with the goal of formulating a conclusion to it. This section contains chapters dedicated to analyzing how each of the research question groups have been addressed and answered, an assessment of the research methodology and process, and a commentary on the knowledge that has been generated through the realization of this study. As a closing chapter, this section also offers a personal take on the conclusion of the research project.

9.1 Conclusions I: Contextual underlying questions, emerging technologies

●━━●━━●━━●━━●━━●━━●━━●

With these questions, this research aimed to determine how the development and utilization of the new emerging technologies could potentially affect the human civilization through the next decades, while also exploring the readiness level of contemporary society in regard to their sensible utilization, with the goal of discerning how the artistic, academic and cultural institutions could be redefined in order to foster more responsible and humane use of these technologies.

Based on the qualitative analysis of <u>the articles that concern this topic</u>[5.1], it can be concluded that the new emerging technologies will have an extremely significant impact on the world, <u>with each one of them being capable of completely redefining contemporary society for better or worse</u>[7.1.2]. This analysis also exposes that the unfolding of these technologies, while progressive, will be of an accelerating nature, a fact that is likely to cause extreme social disruption throughout the entire world as the century moves forward. What is more, this study also reveals that contemporary human civilization is largely underprepared to utilize these technologies in a sensible manner, a factor that, when paired with their accelerating nature, could cause extreme amounts of social upheaval and potentially even lead to a societal collapse.

By contrasting these analyses with those that concern <u>the nature of our species</u>[7.2.3], this research determines that most of the significant problems that have emerged as a result of our relationship with technology, and that could potentially emerge from the development and utilization of the new emerging

technologies, stem from our continued inability as a species to reconcile our <u>tribal nature</u>[7.2.3] with the <u>exponentially evolving nature of technology</u>[7.1.2], exposing that if this problem is not solved before this relation reaches a critical point, our species would become completely overloaded by the new emerging technologies, forcing us to either rely on potentially extremely dangerous Artificial Intelligence system or to enhance our minds and bodies with technology to avoid becoming obsolete.

This research also determines that the new emerging technologies, and our relationship with technology as a whole, will play a very significant role in shaping and determining the outcome of the many natural and human-caused challenges and events that will unfold in the foreseeable future, determining that said events will coalesce into a critical period defined as *The Machine at the Crossroads*[7.1], remarking the imperative need to sensibly adapt to the development and unfolding of these technologies if we are to overcome the crossroads and venture into the future in any significant way.

In response to these situations, this study concludes, by contrasting the <u>nature of these technologies</u>[7.1.2] with the <u>nature of and history of our species</u>[7.2], and that of <u>emergent evolutive systems</u>[5.3.2], that by conducting a sensible redefinition of our <u>artistic</u>[8.1], <u>academic</u>[8.2] and <u>cultural</u>[8.3] disciplines in tune with our human nature, the nature of technology and the nature of emergent evolutive systems, we could potentially reconcile those nature with one another through <u>the progressive creation of an emergent academic and cultural network that could potentially emerge from said redefinition</u>[8.3.2]. Nevertheless, this study determines that said redefinitions would significantly contribute to the sensible utilization of the new emerging technologies even if they are conducted in isolation from each other, but poses that only if they are realized in conjunction with each other would those three natures be fully reconciled.

9.2 Conclusions II: Contextual underlying questions, emerging challenges

With these questions, this research aimed to identify and analyze the emerging natural and human-caused challenges that are set to define the next one hundred years, with the goal of both evaluating the current level of preparation that the contemporary human civilization has against these events, and of exposing how the artistic, cultural and academic disciplines could be redefined to help us overcome them in a sensible way.

Based on the qualitative analysis of the studies that explore these subjects[5.2], it can be determined that the emerging challenges of our time, no matter their origin or nature, are set to define the foreseeable future in a very significant way, exposing that if our civilization doesn't manage to overcome every single one of them in a reasonable and humane way, their unfolding might severely disrupt human society, or even lead our species to extinction. In the chapter titled *The Machine at the Crossroads*[7.1] These challenges are uncovered and analyzed in detail, concluding that, while each one of them has the potential to threaten our civilization and the planet we inhabit, it is the risk of them becoming increasingly more evident and difficult to counter as the century progresses, and of them potentially reaching their critical points in quick succession from one another once we reach the latter decades of the century, that poses the highest risk.

This study names such an event *The Machine at the Crossroads*, for it, identifies that the manner through which our species manages to overcome these challenges will define its future in a very significant way, while also exposing that the

development and utilization of the new emerging technologies, and especially of advanced Artificial Intelligence systems, <u>are likely going to play a key role in the resolution of this crossroads</u>[7.1.5], for better or worse, posing that only a sensible and responsible utilization of them could lead to our species not becoming obsolete or even extinct.

Afterward, this dissertation concludes that <u>the contemporary human civilization is significantly unprepared to face, and much less so overcome, these challenges</u>[7.3], determining that unless a significant sensible redefinition of our, artistic, academic, cultural, and organizational institutions and disciplines is conducted before these challenges reach their critical points, we might not be able to overcome them at all. In response to this situation, this dissertation explores and exposes how such redefinitions could be conducted through the chapters dedicated to the <u>artistic</u>[8.1], <u>academic</u>[8.2], and <u>cultural</u>[8.3] disciplines, determining that such a redefinition would have to manage to reconcile our tribal nature with the nature of technology and that of civilization to be successful, posing the adoption of the <u>secular humanist principles</u>[6.2] and of <u>emergent social networking</u>[8.3.2] as a possible solution.

9.3 Conclusions III: Contextual underlying questions, emerging challenges

With these questions, this research aimed to identify and analyze the nature of evolutive emergent systems, especially in regard to the evolution of life, intelligence, and consciousness, with the goal of finding structural and communicational patterns that could help define emergent forms of artistic, academic and cultural networking capable of helping our species face the challenges posed by the future in a sensible way. This research also aimed to clarify if an evolutive emergent mind could form as a consequence of human interaction reaching a critical complexity mass in the foreseeable future, and of said mass being stimulated by events that would force it to adapt to significant environmental challenges.

After having analyzed the relevant literature[5.3], this research concludes that there are many structural and organizational patterns that define emergent systems that the artistic, academic, and cultural disciplines could adopt to become more sensible entities capable of mediating between human nature, the nature of technology and that of civilization[8.3.2]. However, this study also concludes that, because the exceeding complexity of the matter at hand, a completely dedicated research effort would be necessary to devise how said structural patterns could be utilized to redefine said disciplines successfully, and especially in a way that would be beneficial to the overcoming of The Machine at the Crossroads[7.1].

In what concerns the potential emergence of an evolutive emergent mind as a consequence of human interaction, this research determines that the following decades, and especially

the period of time defined as the crossroads[7.1], contains all the necessary characteristics, as defined by the precedent research studies conducted on the topic[5.3.2.1], to hypothetically foster such an emergence, as this time period is likely going to cause human interaction to reach its maximum complexity mass, while the many adaptational challenges and events posed by said time period could be enough to cause such emergence to occur[7.1.6]. Nevertheless, this study also concludes that, because such an emergent mind would emerge from the nature and identity of the human civilization as a whole, such a mind would only be beneficial to our species if we manage to sensibly redefine our civilization before its emergence comes to happen, for, as much as our contemporary civilization[7.3], it could potentially be irrational or self-destructive otherwise. In the case of this mind being positive, however, it would prove to be invaluable to help our species reorganize itself sensibly in a non-imposing and emergent way, while also potentially being capable of serving as an intermediary between our civilization and other super-intelligences[7.1.5].

However, as this is a very complex and relatively young field of study, this dissertation concludes that it would be necessary to conduct dedicated research efforts that explore this topic if we are to clarify if such an emergence is possible. However, this study determines that, even if an emergent evolutive mind was not to form from human interaction, the adoption of the patterns that define emergent systems by the artistic, academic, and cultural disciplines could prove to be extremely beneficial to the whole of our species, as the utilization of those patterns could potentially go a long way in helping our species reconcile its own nature with that of technology and civilization[8.3.2].

9.4 Conclusions IV: Contextual core questions

With these questions, this research aimed to evaluate the state of the socio-economic, artistic, academic, and cultural structures and disciplines that define the contemporary world, with the goal of determining how they might react and adapt to the emerging challenges of our time, and whether if, in their current state, their influence towards the whole of our species would contribute to the overcoming of those challenges or not.

Based on the qualitative analysis of the pertinent literature, which includes articles concerned with studying the nature and expected evolution of the contemporary socio-economic[5.2], artistic[5.5], academic[5.6], and cultural[5.4] disciplines in the context of the foreseeable future, this dissertation concludes that all of these disciplines are currently completely detached from the realities of the world[7.3], and that their influence towards society as a whole, and especially in what concerns the overcoming of *The Machine at the Crossroads*, is more than likely going to cause way more harm than good, determining that it will be essential to commit a sensible redefinition of these disciplines in the immediate future if we are to overcome the challenges posed by the future.

This research identifies that the main reason why these disciplines are in such a state resides in the continued inability of our species to reconcile its tribal nature with the nature of technology and civilization[7.3.1], exposing the perceptive limitations imposed by our tribal nature[7.2.3], summed to our necessity to develop and utilize highly hierarchical and specialized social structures as a way to be able to handle the increasing amounts of information generated by complex social

structures and technological development, produces an extremely perceptive and emotional dissonance between the many members and aspects that define civilization. With this dissonance becoming more severe the higher an individual is in the social hierarchy, it becomes evident where the many inequalities and short-sighted decisions that have defined and still define our world proceed from, as those individuals who have managed to accumulate large amounts of power are still bound by their tribal nature, and thus act in favor of what they perceive as their tribal space in detriment to everything and everyone else.

This dissertation identifies that, throughout our history, the human civilization has attempted to utilize technology and hierarchical organization to grow past our tribal limitations, but that our continued inability to recognize said tribal nature in the first place has only led to the perceptive dissonance and its consequences to become increasingly more severe after each significant technological and cultural leap, a process that[7.3.1], if not solved through the commitment of a sensible redefinition of our cultural and organizational that manages to reconcile those natures, could lead to the complete collapse of the human civilization in one way or another[7.1.5]. What is more, this study also concludes that the most significant negative aspects that have defined the human civilization throughout our history, and consequently many of the debts that we have accumulated as a species[7.1.4], have their root cause in this problem, and that, therefore, it is essential that we manage to reconcile our tribal nature with the nature of technology and that of civilization if we are to overcome the crossroads and venture into the future[7.1.5].

However, this study also identifies that contemporary society is not only not trying to solve this problem, but that it is instead doubling down on employing the same flawed solutions we have utilized so far to attempt to grow past our tribal nature. All seems to point out that leading world powers

will do their utmost to develop <u>advanced Artificial Intelligence and Information systems</u>[7.4.2], as well as <u>hastily prepared social reforms</u>[7.4.1], to attempt to overcome the challenges posed by the future, a development that could potentially lead to a <u>technological overload</u>[7.1.2], as it is very likely that contemporary civilization will be unable to make sensible use of those technologies unless if our species manages to reconcile itself with its tribal nature beforehand.

9.5 Conclusions V: Core research questions

With these questions, this research aimed to determine how the artistic, academic, and cultural disciplines could evolve and adapt in the face of the unfolding of the new emerging technologies and the challenges posed by the future, with the ultimate goal of exploring how they could be redefined in a way that would help our species adapt to and overcome said challenges in a sensible way.

In what concerns the immediate future of the artistic disciplines, this study concludes, based on the analysis of the pertinent research material and literature[5.5.2.1], that while the current state of the art world is dire and in danger of being completely assimilated by the globalized culture and the speculative markets[7.3.4], there is still much that contemporary artists can do to resist such a fate, as long as they manage to develop an art form that is critically minded and serves as a way to encode their perception of the world into a creative process that makes a sensible exercise of the artistic mindset[8.1.2].

However, this dissertation also determines that there is very little that contemporary art can do to influence society in a positive way, for the influence of the globalized culture and mass media has eroded the perception and sensibilities of modern individuals too much for them to be susceptible to the influence of art[7.3.5]. Therefore, this study concludes that any form of sensible contemporary artistic movement would ultimately have to be focused on the preservation of the artistic mindset on itself through the conduction of the artistic process in an intimate and critically minded way[8.1.2], with the hopes that, once the

challenges posed by the future start to unfold themselves, the structure of society would become disputed enough for society to become emancipated from the influence of the globalized cultures, <u>thus allowing the artistic disciplines to be redefined from the ground up in a sensible way</u>[8.1.2], a series of development that would also necessitate the sensible redefinition of the academic and cultural disciplines.

In what concerns the artistic mindset on itself, this dissertation analyzes its nature and <u>exposes it as an essential aspect of the human being</u>[8.1.1], framing it as one of the main driving forces behind creativity, innovation, diversity, and personal happiness. Concluding that the fostering of this mindset through the entirety of society would likely be essential for the sensible overcoming of <u>The Machine at the Crossroads</u>[7.1], this study also determines that said mindset is at risk of being diluted away by <u>the influence of the globalized cultures</u>[7.3.5], thus posing the roles that <u>contemporary artists</u>[8.1.2] and <u>academia</u>[8.2] would have to fulfill to prevents its dilution and encourage its propagation. Most relevantly, this dissertation concludes that contemporary artists could, alongside the exercise of their professional work as artists, <u>offer their services as consultants in any other human discipline</u>[8.1.4], allowing those disciplines to directly benefit from the artistic mindset while allowing artists to earn revenue beyond their core professional work. This dissertation concludes that <u>this development would be especially beneficial to the scientific and technological disciplines</u>[8.1.3], as a sensible artist could help research grow beyond the emotional and perceptive limitations they tend to develop as a consequence of the insular nature of the environments they are accustomed to working on.

In what concerns the advent of the emergent technologies and their relation to the artistic disciplines, this dissertation concludes that, <u>as these technologies are more than likely going</u>

to play a key role in shaping the world of tomorrow[7.1.2], it will be essential for contemporary artists to learn how to utilize said technologies in a sensible manner if they are to remain relevant for the foreseeable future. This study then explores how the artistic disciplines could interact with these technologies, proposing a revival and updating of the spirit of The Bauhaus as the most sensible path to take in what concerns this relationship[8.1.3], arguing that said development would be extremely beneficial to the artistic disciplines themselves and society at large.

In regards to the future of the academic disciplines, this dissertation determines, based on the analysis and contrast of the chosen research literature[5.6], that the current state of contemporary academia arguably leaves a lot to be desired when it comes to providing a sensible educational and academic environment[7.3.3] as a consequence of the ties the current system has with traditional organizational structure and power hierarchies, ultimately pointing out that most contemporary educational and academic institutions are very likely to be unable to help individuals adapt to and overcome the challenges posed by the future. Arguing that the existence of a well-developed and easily accessible form of academia would be primordial for the successful overcoming of the crossroads, as such an environment could be key in permitting individuals to adapt and overcome the many challenges posed by it as they start to unfold, this study concludes that the best course of action would be to conduct a sensible redefinition of the academic and educational institutions realized in tune with the secular humanist postulates[8.2], ultimately exposing the changes in academia such a redefinition would have achieved.

In general terms, this study determines that, aside from being based on those humanist principles[6.2], this form of redefined academia would have to be able to provide universal and free access to a complete educational and academic process

tuned to those postualtes[8.2.3], would have to internalize and educate about the sensible exercise of the artistic mindset[8.2.2] so that said mindset can be progressively fostered through the world, and would also have to help individuals understand and sensibly utilize the new emerging technologies[8.2.4] so that they might properly adapt to them. This study also concludes that, because creating such an academic environment would require an extreme amount of resources to be accomplished because o its universality, the only practical way to do so would be to develop it through the creation of a series of Artificial Intelligence Based automated academic guides, tools, networks, and environments[8.2.3].

Lastly, this dissertation determines that, because such a redefinition of academia would have to be tuned to our tribal nature[7.2.3] while also having to account for the nature of technology[7.1.2] and that of the crossroads[7.1], it would be optimal for it to emerge from the actions and interactions of individuals rather than from the input of specific organizations, as an emergent academia would, by its very nature, be able to synergize those aspects[8.3]. Consequently, this dissertation poses that the creation of an automated academic seed from which a sensible form of academia could emerge would be the most adequate way to foster such a redefinition[8.2.5]. Concluding that the realization of this type of redefinition of the educational and academic disciplines, and the designing of such an academic seed, would be of a considerably complex and laborious nature, this study presents these postulates and ideas as a form of foundation from which a complete study can be conducted on the matter, inviting the creation of a research team to undertake such an endeavor[8.2.6].

In what concerns the future of the cultural disciplines and of culture in itself this dissertation determines, based on the relevant research material[5.4], that contemporary culture is in an extremely deteriorated state that impedes it from being of

use to individuals in the face of the impending challenges we will face as a species[7.3.5], especially as a consequence of the capacity that globalized culture has developed to assimilate, trivialize, commercialize and dilute specific cultures through the imposition of mass media and social networks worldwide. After identifying that the state of culture worldwide will only worsen if no significant action is taken against the influence of globalized culture, and that the increasing influence of Chinese culture is likely to foster the emergence of an eastern type of globalized culture that will likely exist in opposition to the western one[5.4.2.2], this study concludes that it is primordial that an emergent cultural renaissance capable of reconciling our tribal nature[7.2.3] with the nature of technology[7.1.2] and that of civilization[7.3] is fostered in the immediate future, arguing that we might become completely unable to overcome the crossroads otherwise.

This dissertation then determines that the creation of an emergent form of cultural network through the designing and propagation of a cultural seed capable of fostering such a cultural renaissance would be the optimal path to follow in this regard[8.3.2], as the emergent form of culture that would theoretically form from the usage of such a network would be able to finally reconcile those three natures thanks to the synergic feedback loop it would establish between all of its constituents and itself[8.3.1], dramatically increasing the diversity, innovative output and stability of the human civilization as a consequence, which would significantly increase our chances of successfully overcoming the crossroads.

What is more, this study concludes that such a network would permit the emergence of a universal form of culture that would not negatively interfere with the existence of specific cultures[8.3.2], a development that would arguably also facilitate the sensible integration of synthetic intelligent lifeforms into our civilization, something that could prove to be key to the

resolution of the crossroads. This dissertation also determines that in the case that an evolutive emergent mind was to form as a consequence of human cause interactivity reaching a sustained critical mass in the period defined as the machine at the crossroads[7.1.6], this form of emergent culture would significantly contribute to helping such a mind form itself in a sensible way that would have the best interests of our civilization at hearth[8.3.2], which would further increase our chances of overcoming the crossroads.

Evidently, as the designing and fostering of an emergent form of cultural network would be an extremely complex undertaking, this study presents these findings and postulates as a foundation from which such a system could be designed by a dedicated research team[8.3.3].

9.6 Conclusions VI: Chosen research methodology and theoretical framework

In the grand part, I consider that ***my chosen research methodology***, that one being the <u>Qualitative research Method</u>[4.1], has proven to be optimal for the conduction of this study, as said method has perfectly aligned with the necessities and nature of the project. While it is true that some of the topics this study has analyzed could have been studied in a more quantitative manner, chief among those topics being the analysis of the new emerging technologies and the studying of the natural laws of evolution and emergence, I consider that the qualitative analysis of those subjects has been sufficient to gather the data I required to answer my research questions, as those questions were more concerned with exploring how those aspects of our world could interact with culture, art, academia, and society than on exposing the more specific aspects that define them.

In what concerns my chosen data collection method, I have to point out that, while I was initially concerned about having to completely rely on the recollection and analysis of preexisting studies <u>as a consequence of being unable to realize my plans to collect new data</u>[4.2], a situation that was caused in grand part by the reluctancy shown by those field experts I wanted to interview to participate In my study, and by the emergence of the COVID 19 global pandemic disrupting the academic channels I depended on to conduct my planned surveys, this method proved to be more than adequate to provide me with the data I required to answer my research questions. What surprised me the most was how dynamic the data recollection and analysis became once I had created the necessary pipelines to do so, which allowed me to

gather and integrate new data into the project through its entire process as new relevant articles got published.

In what concerns **_my chosen research frameworks_**, <u>I consider that they have been most appropriate</u>[6.0], for they have been able to provide an optimal foundation from which to conduct my dissertation by allowing me to synergize the analysis of the many topics it studies, and by permitting me to construct my postulates within a set of clearly defined research fields within the artistic, cultural and academic disciplines. On a personal note, it has been a privilege to continue the work started by those individuals whom I have admired since my childhood, even if it has been in an indirect way.

9.7 Conclusions VII: Reflections on the research process

When it comes to reflecting on the research process of this dissertation, the first impression that comes to my mind is how surprisingly straightforward it has been. When I started to work on this project back in the latter months of 2018, but especially <u>after I defined its research questions</u>[3.5], I was concerned about my ability to successfully carry out the research to its conclusion, for I was overwhelmed by its sheer complexity and interdisciplinary nature. Back then, my research tutors and many others advised me to scale the project down, pointing out that it was very unusual for a doctoral dissertation to tackle as many topics as mine. I took this advice very seriously, and thanks to it I managed to focus and refine the project further by organizing my research questions depending on their relevance to the core problem I wanted to solve, thus cataloging them, and their respective topics, as either contextual or core aspects of the dissertation. In retrospect, this development proved to be crucial for the research project, for I believe that if I hadn't conducted such a reclassification of my research questions and topics, I would have been overwhelmed by them.

From that point onwards, and after I had chosen <u>the research method I was going to utilize</u>[4.1], the research project started to unfold relatively well, with the only significant hiccup being that of <u>becoming unable to perform the interviews and surveys I had initially prepared</u>[4.2] as a consequence of, among other factors, the disruption caused by the COVID-19 pandemic. Once I became comfortable with the idea that I would have to almost entirely rely on the analysis and contrast of pre-existing data to conduct my dissertation, everything became way

simpler, and over a period of time that started in late 2019 and ended roughly at the midpoint of 2021, I collected and analyzed the bulk of the information I required to conduct my dissertation, finally synthesizing it into a literature review [5.0] by the end of that year. However, I continued searching and incorporating new data into the project until its conclusion.

After that point, I utilized the information exposed in said literature review to answer my research questions in tune with my chosen research frameworks[6.0], a process that took me eight months to complete. First, I shaped my contextual arguments[7.0], a process that required the answering of my contextual research questions[3.5] through the analysis and contrasting of the relevant literature, which proved to be laborious but not necessarily very complicated. Afterward, taking all the work I had conducted so far as a foundation, I answered the core research questions of my dissertation[3.5.5] through the creation of my postulates[8.0].

Evidently, the writing of those chapters proved to be the most challenging part of the entire project, but despite that I found the entire process to be free of any significant hindrances. My chosen theoretical frameworks provide the parting point from which to answer my core research questions, the information contained in my literature review and the analysis conducted in the contextual chapters allowed me to identify how to sensibly answer those questions by exposing both the problems I had to solve and the ways through which they could be solved in a sensible manner, and lastly, my understanding of the artistic, academic and cultural disciplines permitted me to answer those questions effectively.

Most relevantly, I argue that the most significant discoveries I made in my research were those of defining The Machine at the Crossroads[7.1] as the most significant obstacle we need to overcome as species in the foreseeable future, and of identifying

the dissonance that exists between the tribal nature of our species[7.2.3] and the nature of technology[7.1.2] as the main culprit behind many of problems that have defined and still define our civilization, as these discoveries allowed me to answer all my research questions in a unified manner. In grand part, I came to this realization simply by contrasting the history of our species, with that of natural evolution, technology, culture, art, academia, and civilization, a process in which studying the works of *Buckminster Fuller* (Fuller, 1969) *Todd E. Feinberg*, *Jon Mallatt* (Feinberg and Mallatt, 2020) and *Jared Diamond* (Diamond, 1999) [10.3.1.18] played a key role.

Especially that second discovery allowed me to identify how the artistic, academic, and cultural disciplines could be redefined in a way that would theoretically permit our species to reconcile its tribal nature with that of technology and civilization and also exposed how the academic and cultural initiatives that defined a part of my theoretical framework[6.0] had already attempted, even if unknowingly, to solve this problem. Consequently, in a non-insignificant way my work became a continuation of the one once conducted by *The Bauhaus*[6.5] and *The Black Mountain College*[6.6], which allowed me to frame and construct my postulates in a way more complete and clearly defined way. I consider that the uncovering of a potential evolutive emergent occurring as a consequence of human interaction reaching a critical mass point during the period defined by The Machine at the Crossroads[7.1.6] was also one of the highlights of this research process, yet I recognize that, because of the extremely experimental nature of the matter at hand, its true relevance could only possibly be unveiled if significant more research is conducted on the topic.

In the end, the research process of this dissertation concluded with the definition of further research initiatives that, taking my work as a foundation, could help materialize my posed redefinitions of the artistic[8.1.5], academic[8.2.6], and

<u>cultural</u>[8.3.3] disciplines in a sensible manner that could have a significant positive impact in the future of our species. Only time will tell if those studies and projects are conducted or not, but what I can say in that regard is that I will do my utmost to continue the work I have started with this dissertation to the extent of my resources and abilities, both within the academic and cultural disciplines.

9.8 Conclusions VIII: Reflections on contributed knowledge

When I created the <u>literature review of this dissertation</u>[5.0], I exposed the knowledge gaps that I believed I could attempt to solve through my research. Although it is evident that I have not been able to address all of those gaps directly, I believe that the knowledge this research project contributes will significantly aid in their eventual resolution, for it manages to expose the many aspects that define those gaps, and poses research initiatives that could potentially solve them. In regards to those cases in which I have been able to address these research gaps in a more complete manner, I consider that the knowledge I contribute to their respective fields could be of significant value in the context of redefining those disciplines in a sensible manner that could help our species overcome the challenges posed by the future.

First and foremost, in what concerns the advent of **the new emerging technologies**, and <u>the research gaps I exposed in their regard</u>[5.1.3], I consider that my dissertation manages to contribute both <u>an integrative perspective on how these technologies might unfold</u>[7.1.2] <u>and affect society if the current socio-economic, academic and cultural models are not sifted into more sensible forms</u>[7.4] and a series of <u>artistic</u>[8.1], <u>academic</u>[8.2] and <u>cultural</u>[8.3] initiatives that could potentially lead to those technologies being utilized in a positive way if they where to be realized. Most notably, I argue that my argument in regards to <u>the dissonance between our tribal nature, the nature of technology, and the nature of our civilization</u>[7.2.3] is the likely culprit behind why our species <u>is becoming increasingly less capable of utilizing advanced technologies</u>[7.1.5] is of high relevance, for I consider that its addressing and study could

help our civilization reconcile those three natures, <u>thus solving one of the most significant weaknesses of our civilization</u>[7.1.3], one that could potentially cause a technological overload if is left unaddressed for too long.

On top of this, I believe that my <u>artistic</u>[8.1], <u>academic</u>[8.2] and <u>cultural</u>[8.3] postulates are of special importance in regard to the fields of Artificial Intelligence Genetic Engineering, and Cybernetics, for I argue that my posed redefined socio-cultural and academic environments would very significantly contribute to those technologies being developed and utilized in reasonable and democratic ways, <u>which would be essential if we are to overcome the challenges posed by the future in a way that doesn't require the complete abandonment of our nature</u>[7.4]. Above all else, I consider that such artistic, cultural, and academic environments would help our species address the creation of complex synthetic lifeforms, the uplifting of animal species, and the augmentation of our own bodies and intelligence <u>in ways that are both humane and reasonable</u>[8.2.4].

In regards to the knowledge that concerns **the emerging challenges of our time** and their <u>respective research gaps</u>[5.2.3], I consider that my dissertation manages to provide <u>a thorough analysis of the subject</u>[7.0] that not only exposes the defining characteristics and possible impacts of these challenges, but that also contributes a unified understanding of their nature through the conceptualization of <u>The Machine at the Crossroads</u>[7.1], and <u>the construction of the hypothesis that identifies the dissonance between our tribal nature, the nature of technology and the nature of civilization</u>[7.2.3] as the main cause behind the many debts we have accumulated as a species, and by their extension, of those challenges. I argue that this contribution, summed to the knowledge <u>provided by my postulates</u>[8.0], exposes a multitude of ways through which these challenges could be addressed, which could be invaluable for those fields affected by them.

When it comes to the topic of **evolutive emergent systems and neural structures,** I consider that my dissertation manages to contribute knowledge that could be really helpful in solving their most significant research gaps[5.3.3], for it offers an interdisciplinary and integrative perspective of those fields in relation to the rest of the aspects of the human civilization, exposing how they could be hybridized with the academic and cultural disciplines in a synergic way that could be beneficial to all parties[8.3]. Above all else, I consider that my proposition for a research initiative that could design an emergent form of social, cultural, and academic network capable of reconciling our tribal nature, with the nature of technology and that of civilization through emergent networking[8.3.2] is of great value to these fields of study.

Although I recognize that my theory on an evolutive emergent mind forming as a consequence of human interactivity and organizational complexity reaching a critical mass in the latter stages of The Machine at the Crossroads[7.1.6] is a very far-fetched idea, as there is no practical way of testing if such an emergence could even be possible unless it comes to happen, I argue that it at the very least provides an interesting outlook into the subject of evolutive emergence, as it poses a scenario that could prove the nature of consciousness as a weak emergent system, for the emergence of such a mind would be experienced by the whole of humanity collectively and simultaneously, thus permitting its objective analysis.

Lastly, in regard to the fields of **art, academia, and culture,** I consider that this dissertation manages to contribute a considerable amount of very valuable knowledge that could help those disciplines adapt to the challenges posed by the future and evolve into more sensible forms, for it manages to address all of the posed research questions[3.5.5] and identified research gaps[5.4.3,5.5.3,5.6.3] successfully.

First, my study provides an in-deep interdisciplinary analysis of the current state of the artistic[7.3.4], cultural[7.3.5], and academic[7.3.3] environments and disciplines, founded on the research frameworks provided by the analysis conducted on the works of Hal Foster[6.7], Ramon Zallo[6.3], and Buckminster Fuller[6.4], and realized in the context provided by the concept of The Machine at the Crossroads[7.1]. I argue that this analysis on its own is of a significant contextual value and that it could be very useful to any of these disciplines. Then, my study utilizes this knowledge to pose a series of artistic[8.1], academic[8.2], and cultural[8.3] initiatives that could help those disciplines be redefined into more sensible forms capable of helping our species overcome the crossroads, culminating in the proposition for a research initiative focused on designing an emergent human network theoretically capable of reconciling and synergizing our tribal nature with the nature of technology and the nature of civilization[8.3.2].

I argue that each of these contributions could be of very significant value for their respective disciplines on their own, as it could provide those who define them with the knowledge necessary to redefine them into a more sensible form that is more tuned to our nature and the challenges posed by our time. However, I consider that the true value of these postulates resides in their interdisciplinary use, as I argue that their collective and synchronized utilization could generate a series of synergies that would drastically increase their beneficial output, especially if they are realized in parallel to the designing and creation of an emergent human network. Nevertheless, it is important to remember that most of this knowledge is very experimental in nature and that it would be necessary to conduct further research into these topics before these theories can be applied in a practical manner. **Therefore, I consider that the most relevant contribution of this part of my research is academic, as it provides a foundation on which to define and conduct those research initiatives[8.3.2].**

9.9 Conclusions IX: Closing words

In general terms, I consider that the realization of this research dissertation has been a success, as I have been able to address all my posed research questions either directly or indirectly. I'm quite satisfied with the quality of the knowledge this process has generated, and I sincerely hope that it is of use to both academia and the world at large, especially in regard to the realization of further research projects and social initiatives that could help our civilization evolve into a more sensible form capable of not only overcoming the challenge posed by the future but of venturing into said future with grace, ambition and reason.

In what concerns my person, it is my intent to base my future work on the findings provided by this study. As a nascent artist and filmmaker who has always been fascinated and concerned by the future, and an aspiring academic researcher who hopes to contribute to the betterment and advancement of our civilization, I am determined to use the knowledge I have generated through this dissertation to create fictional stories and documentaries that manage to capture the nature and significance of our time, to shape artworks that encode my perception of the world in ways that are fulfilling to myself and inspiring to others, and to define and conduct research initiatives focused on exploring the relationship between our species, technology and nature further.

The realization of this thesis dissertation has been an exhausting yet fascinating experience, and with it finally concluded I can finally breathe a sigh of relief and embrace my own future with hope, passion, and curiosity. What the future

might hold for our species is yet to be discovered, but we can say for sure is that, despite everything, we are likely going to live through very interesting times.

What would I ask of the machine at the crossroads? for it to be a friend, a friend with whom to discover the world of tomorrow.

10 Bibliography
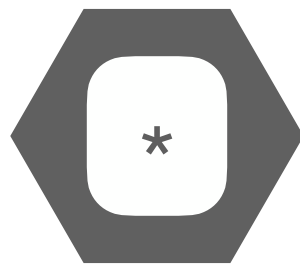
10.0 Introduction to Bibliography

This is the last section of the dissertation, and contains the bibliography of the entire project. I think it is relevant to mention that I initially created a more unique bibliographical system for this dissertation, one that was organized thematically and chronologically. I judged that such a structure would help me remark on the ever-evolving and changing nature of the topics I analyze and discuss. However, I ultimately decided to replace that initial bibliography with one more attuned to academic conventions, an alphabetically organized one.

10.1 Bibliography

This last section contains the entire bibliography of the research project, organized alphabetically.

10.1.1 Bibliography

- *101 Blockchains* (2021) Centralized vs. Decentralized: What Are the Core Differences?, 15 August. Available at: https://101blockchains.com/centralized-vs-decentralized-internet-networks/ (Accessed: 27 December 2021).

- Aggarwal, S. Sinha, T. Kukreti, Y. Shikhar, S. (2020) Media bias detection and bias short term impact assessment, 100025(6). Available at: https://www.sciencedirect.com/science/article/pii/S2590005620300102#sec6 (Accessed: 4 January 2022).

- Alston, J. (2020) The future of genetic engineering, *NewEngineer*, 5 August. Available at: https://newengineer.com/blog/the-future-of-genetic-engineering-1383253 (Accessed: 1 September 2021).

- American Psychological Association (APA) (2019) Speaking of Psychology: *The decline of empathy and the rise of narcissism* [Podcast] December. Available at: https://lit.libguides.com/Write-it-Right/www#s-lg-box-14644023 (Accessed: 7 September 2021).

- Andrews, C.A. (2010) Natural Selection, Genetic Drift, and Gene Flow Do Not Act in Isolation in Natural Populations, *Nature Education Knowledge*, 3(10):5. Available at: https://www.nature.com/scitable/knowledge/library/natural-selection-genetic-drift-and-gene-flow-15186648/(Accessed: 14 May 2022).

- Anheier, H.K. (2020) Cultures, Values, and Identities: What Are the Issues?, *Global Perspectives*, 1(1). Available at: https://online.ucpress.edu/gp/article/1/1/11755/106232/ (Accessed: 24 May 2022).

- AP (2020) China failed to warn public of coronavirus threat for days: AP, *Aljazerra*, 15 April. Available at: https://www.aljazeera.com/news/2020/4/15/china-failed-to-warn-public-of-coronavirus-threat-for-days-ap (Accessed: 11 December 2021).

- Art In Context (AIC) (2022) *Renaissance Humanism — An Exploration of Humanism in the Renaissance.* Available at: https://artincontext.org/renaissance-humanism/ (Accessed: 29 June 2022).

- Attar, A.E. (2020) The alter-globalization movement: An alternative perspective of an alternative world, *InfoMineo*, 22 December. https://infomineo.com/the-alter-globalization-movement-an-alternative-perspective-of-an-alternative-world/ (Accessed: 6 October 2021).

- Avishai, B. (2020) The Pandemic Isn't a Black Swan but a Portent of a More Fragile Global System, *The New Yorker*, 21 April. Available at: https://www.newyorker.com/news/daily-comment/the-pandemic-isnt-a-black-swan-but-a-portent-of-a-more-fragile-global-system (Accessed: 11 December 2021).

- Berzin, R. (2020) Want to Slow Down Aging? Meet Your Telomeres*, Parsley Health Articles*, 4 November. Available at: https://www.parsleyhealth.com/blog/telomeres-stay-young-aging/ (Accessed: 1 September 2021).

- Bettenhausen, C. (2021) The life-or-death race to improve carbon capture, *C&EN*, 18 July. https://cen.acs.org/environment/greenhouse-gases/capture-flue-gas-co2-emissions/99/i26 (Accessed: 28 October 2021).

- Beuys, J. Böll, H. (1973) 1973 Manifesto for the Free International University, *Free International University for Creativity and Interdisciplinary Research,* 27 April. Available at: https://sites.google.com/site/socialsculptureusa/freeinternationaluniversitymanifesto (Accessed: 15 November 2021).

- Bloomberg (2020) *Nassim Taleb Says 'White Swan' Coronavirus Pandemic Was Preventable*. 31 March. Available at: https://www.youtube.com/watch?v=lBjVTm7F1lQ (Accessed: 11 December 2021).

- Bocquet-Appel, J.P. (2011) When the World's Population Took Off: The Springboard of the Neolithic Demographic Transition, *ADS*, 333:6042. Available at: https://ui.adsabs.harvard.edu/abs/2011Sci...333..560B/abstract (Accessed: 14 May 2022).

- Bossetta, M. (2018) The Digital Architectures of Social Media: Comparing Political Campaigning on Facebook, Twitter, Instagram, and Snapchat in the 2016 U.S. Election, *Journalism & Mass Communication Quarterly Association for Education in Journalism and Mass Communication*, 28 March. Available at: https://journals.sagepub.com/doi/full/10.1177/1077699018763307 (Accessed: 26 October 2021).

- Boxall, A. Lacoma, T. (2021) What is 6G, how fast will it be, and when is it coming?*, Digital Trends*, 3

June. Available at: https://www.digitaltrends.com/mobile/what-is-6g/ (Accessed: 26 April 2021).

- Bridgestock, L. (2021) How Much Does it Cost to Study in the US?, *QSTopUniversities*, 28 May. Available at: https://www.topuniversities.com/student-info/student-finance/how-much-does-it-cost-study-us (Accessed: 14 November 2021).

- Cardoso, S.H. (2001) Transcending the Tribal Mind, *Brain & Mind*, (1/01). Available at: https://www.cerebromente.org.br/n09/tribal_i.htm (Accessed: 14 May 2022).

- Carey, T. (2020) Run faster, think better: Hugh Herr on the future of bionics*, FreeThink*, 25 February. Available at: https://www.freethink.com/technology/hugh-herr-future-of-bionics (Accessed: 1 September 2021).

- Carstens, A. (2021) Digital currencies and the future of the monetary system, *Bank For International Settlement*, 27 January. Available at: https://www.bis.org/speeches/sp210127.pdf (Accessed: 19 October 2021).

- Chalmers, D.J. (1996) Facing up to the problem of consciousness, *Journal of Consciousness Studies*, 2(3), pp. 200-219.

- Cho, A. (2020) IBM promises 1000 qubit quantum computer, a milestone by 2023, *Science Magazine*, (September). Available at: https://www.sciencemag.org/news/2020/09/ibm-promises-1000-qubit-quantum-computer-milestone-2023 (Accessed: 16 April 2021).

- Cipresso, P. Giglioli, I. Raya, M. Riva, G. (2018) The Past, Present, and Future of Virtual and Augmented Reality Research: A Network and Cluster Analysis of the Literature, *Frontiers*, 6(11). Available at: https://www.frontiersin.org/articles/10.3389/fpsyg.2018.02086/full (Accessed: 30 April 2021).

- Clark, M. (2021) NFTs, explained, *TheVerge*, 18 August. Available at: https://www.theverge.com/22310188/nft-explainer-what-is-blockchain-crypto-art-faq (Accessed: 25 November 2021).

- Clark, S. (2020) ESA and NASA unveil bold plans for the future of space exploration, *Science Focus*, 14 October. Available at: https://www.sciencefocus.com/news/esa-and-nasa-unveil-bold-plans-for-the-future-of-space-exploration/ (Accessed: 4 September 2021).

- Clements, B.W. Casani, J.A.P. (2016) Emerging and Reemerging Infectious Disease Threats, *NCBI*, 3 May, pp. 245—265. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7150317/

- Concina, M. (2021) Immersive Technology: The Future of Art, *GURAZE*, 7 June. Available at: https://www.curaze.io/femaleonezero/immersive-technology-the-future-of-art (Accessed: 24 November 2021).

- Council for Secular Humanism (CSU) (1980) *A Secular Humanist Declaration.* Available at: https://secularhumanism.org/a-secular-humanist-declaration/ (Accessed: 28 Jun 2022).

- Cox, D. (2017) Nasa's ambitious plan to save Earth from a supervolcano, *BBC Future*, 17 August. Available at: https://www.bbc.com/future/article/20170817-nasas-ambitious-plan-to-save-earth-from-a-supervolcano (Accessed: 14 December 2021).

- Curious (2017) How many people can Earth actually support?. https://www.science.org.au/curious/earth-environment/how-many-people-can-earth-actually-support (Accessed: 28 October 2021).

- Darwin, C. (1859) *On the Origin of Species*. London, United Kingdom: John Murray.

- Daszak, P. Keusch, G.T. Phelan, A.L. Johnson, C.K. Osterholm, M.T. (2021) Infectious Disease Threats: A Rebound To Resilience, *Health Affairs*, 40(2). Available at: https://www.healthaffairs.org/doi/10.1377/hlthaff.2020.01544 (Accessed: 13 December 2021).

- Davies, D. (2021) Facial Recognition And Beyond: Journalist Ventures Inside China's 'Surveillance State', *NPR*, 5 January. Available at: https://www.npr.org/2021/01/05/953515627/facial-recognition-and-beyond-journalist-ventures-inside-chinas-surveillance-sta (Accessed: 26 October 2021).

- Davies, R. (2021) 'Conditioning an entire society': the rise of biometric data technology, *The Guardian*, 26 October. Available at: https://www.theguardian.com/technology/2021/oct/26/conditioning-an-entire-society-the-rise-of-biometric-data-technology (Accessed: 26 October 2021).

- Dawkins, R. (1976) *The Selfish Gene*. Oxford, United Kingdom: Oxford University Press.

- Deshmukh, A. (2021) This Simple Chart Reveals the Distribution Of Global Wealth, *Visual Capitalist*, 20 September. Available at: https://www.visualcapitalist.com/distribution-of-global-wealth-chart/ (Accessed: 29 October 2021).

- Diamond, J. (1999) *Guns, Germs, and Steel: The Fates of Human Societies*. New York, New York, United States: W. W. Norton & Company.

- Diamond, J. (2013) *The World Until Yesterday: What Can We Learn from Traditional Societies?*. London, United Kingdom: Penguin Books.

- Diamond, J. (2013) *Why Did Human History Unfold Differently On Different Continents For The Last 13,000 Years?*, *Edge*, 333:6042. Available at: https://www.edge.org/conversation/jared_diamond-why-did-human-history-unfold-differently-on-different-continents-for-the (Accessed: 18 May 2022).

- Dilmegani, C. (2021) Artificial Intelligence (AI): In-depth Guide [2021 update], *Ai Multiple*, 1 January. Available at: https://research.aimultiple.com/ai/ (Accessed: 3 April 2021).

- Dilmegani, C. (2021) Will AI reach singularity by 2060? 995 experts' opinions on AGI, *Ai Multiple*, 8 August. Available at: https://research.aimultiple.com/artificial-general-intelligence-singularity-timing/ (Accessed: 3 April 2021).

- Drinhausen, K. Brussee, V. (2021) China's Social Credit System in 2021: From fragmentation towards integration, *Merics*, 3 March. Available at: https://merics.org/en/report/chinas-social-credit-system-2021-fragmentation-towards-integration (Accessed: 26 October 2021).

- Earth Science Communications Team (NASA) (2021) *Global Climate Change: Vital Signs of the Planet.* Available at: https://climate.nasa.gov/ (Accessed: 28 October 2021).

- Eisenberg, A. (2018) Full Dive Virtual Reality —
  Coming Soon to a Brain Near You, *LinkedIn*, 19 April.
  Available at: https://www.linkedin.com/pulse/full-
  dive-virtual-reality-coming-soon-brain-near-you-
  aviram-eisenberg (Accessed: 30 August 2021).

- Entrust. (2021) Data from Entrust Reveals
  Contradictions in Consumer Sentiment Toward Data
  Privacy and Security in 2021, *Business Wire*, 28
  January. Available at: https://www.businesswire.com/
  news/home/20210127005682/en/Data-from-Entrust-
  Reveals-Contradictions-in-Consumer-Sentiment-Toward-
  Data-Privacy-and-Security-in-2021 (Accessed: 1
  November 2021).

- Ergas, H. (2019) Trying to redefine museums: a
  disease of our times, *The Australian*, 13 September.
  Available at: https://www.theaustralian.com.au/
  commentary/trying-to-redefine-museums-a-disease-of-
  our-times/news-story/8412ab485b9f29ecc68c2c688eb8a341
  (Accessed: 24 November 2021).

- European Parliamentary Research Service (EPRS) (2019)
  The historical relationship between artistic
  activities and technology development, *Panel for the
  Future of Science and Technology*, 1 May. Available
  at: https://www.europarl.europa.eu/RegData/etudes/
  IDAN/2019/634439/EPRS_IDA(2019)634439_EN.pdf
  (Accessed: 14 July 2022).

- European Space Agency (ESA) (2017) *Space situational
  awareness:Detecting Space Hazards*, ESA Report, 2017.
  Available at: https://esamultimedia.esa.int/
  multimedia/publications/BR-338/BR-338.pdf (Accessed:
  13 December 2021).

- Evans, S. (2021) Analysis: Which countries are historically responsible for climate change?, *Carbon Brief*, 5 October. https://www.carbonbrief.org/analysis-which-countries-are-historically-responsible-for-climate-change (Accessed: 28 October 2021).

- Feinberg, T.E. Mallatt, J. (2020) Phenomenal Consciousness and Emergence: Eliminating the Explanatory Gap, *Front and Psychol*, (12/6). Available at: https://doi.org/10.3389/fpsyg.2020.01041 (Accessed: 4 October 2020).

- Fisher, R. (2020) Often derided, online activism is far more effective than it first appears — but there are big differences between how the political left and right deploy it to spread ideas, *BBC*, 16 September. Available at: https://www.bbc.com/future/article/20200915-the-subtle-ways-that-clicktivism-shapes-the-world (Accessed: 8 September 2021).

- Fisher, S. (2022) What Universal Basic Income (UBI) Is and How It Would Work, *SmartAsset*, 25 April. https://smartasset.com/financial-advisor/universal-basic-income (Accessed: 14 June 2022).

- Fleerackers, A. (2020) WORKS — Art's Work in the Age of Biotechnology, *Polyfield Magazine*, 7 January. Available at: https://artthescience.com/magazine/2020/01/07/works-arts-work-biotechnology/ (Accessed: 25 November 2021).

- Flew, T. (2010) Creativity, the 'new humanism' and cultural studies, *Taylor and Francis online*, 21 October. Available at: https://www.tandfonline.com/doi/full/10.1080/1030431042000214979?needAccess=true (Accessed: 28 June 2022).

- Folgen, J. (2021) Metaverse*, Investopedia*, 21 October. Available at: https://www.investopedia.com/metaverse-definition-5206578 (Accessed: 26 October 2021).

- Folk, E. (2021) What the Future of Renewable Energy Looks Like, *Earth.org*, 22 August. Available at: https://earth.org/the-growth-of-renewable-energy-what-does-the-future-hold/ (Accessed: 3 September 2021).

- Foster, H. (1995) Contra el pluralismo, *El paseante*, 23(25), pp. 80-95.

- Foster, H. (2015) *Bad New Days Art, Criticism, Emergency*. London, United Kingdom: Verso.

- Freidin , E. (2021) China's digital currency takes shape, *The Interpreter*, 8 September. Available at: https://www.lowyinstitute.org/the-interpreter/china-s-digital-currency-takes-shape (Accessed: 1 November 2021).

- Fresco, J. (2018) *The Best That Money Can't Buy*, Venus, Fla: Global Cyber-Visions. (Accessed: 1 January 2021).

- Frey, C.B., Osborn M.A. (2017) The Future of employment: How susceptible are jobs to computerization?, *Technological forecasting and social change*, 114, pp. 254-280.

- Fuller, R.F. (1969) *Operating Manual for Spaceship Earth*. Zurich, Switzerland: Lars Müller Publishers.

- Gent, E. (2018) If We Could Engineer Animals to Be as Smart as Humans—Should We?*, SingularityHub*, 16 January. Available at: https://singularityhub.com/2018/01/16/should-we-use-brain-enhancing-tech-to-uplift-animals-to-our-level/ (Accessed: 1 September 2021).

- Gerretsen, I. (2021) The state of the climate in 2021, *BBC Future*, 11 January. https://www.bbc.com/future/article/20210108-where-we-are-on-climate-change-in-five-charts (Accessed: 28 October 2021).

- Gerstmann, E. (2020) Cancel Culture Is Only Getting Worse, *Forbes*, 13 September. Available at: https://www.forbes.com/sites/evangerstmann/2020/09/13/cancel-culture-is-only-getting-worse/ (Accessed: 24 September 2021).

- Ghosh, A. (2021) Data Security as a Basis for Data Democratization, *The Customize Windows*, 22 March. Available at: https://thecustomizewindows.com/2021/03/data-security-as-a-basis-for-data-democratization/ (Accessed: 26 October 2021).

- Ghosh, P. (2020) The Exodus Of Chinese Manufacturing: Shutting Down 'The World's Factory', *Forbes*, 18 September. Available at: https://www.forbes.com/sites/princeghosh/2020/09/18/the-exodus-of-chinese-manufacturing-shutting-down-the-worlds-factory/ (Accessed: 19 October 2021).

- Gibbons, A. (2009) How We Lost Our Diversity, *Science*, 8 October. Available at: https://www.science.org/content/article/how-we-lost-our-diversity (Accessed: 25 April 2022).

- Gillick, L. Charlesworth, J. (2020) Is This the End of Contemporary Art As We Know It?, *Forbes*, 25 August. Available at: http://search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=bwh&AN=149911278&scope=site (Accessed: 26 August 2021).

- Glenn, C. Florescu, E. The Millennium Project Team. (2018) *State of the Future 19.1*. Digital: The

Millennium Project Team. Available at: http://www.millennium-project.org/state-of-the-future-version-19-1/ (Accessed: 15 April 2021).

- González, C.F. (2021) *El gran sueño de China. Tecno-Socialismo y capitalismo de estado*. 1. Madrid, Spain: TECNOS.

- Goodman, P.S. Chokshi, N. (2021) How the World Ran Out of Everything, *The New York Times*, 1 June. Available at: https://www.nytimes.com/2021/06/01/business/coronavirus-global-shortages.html (Accessed: 19 October 2021).

- Gostin, O.L. Halabi, S.F. Phil, M. Klock, K.A. (2016) An International Agreement on Pandemic Prevention and Preparedness, 326(13). Available at: https://jamanetwork.com/journals/jama/fullarticle/2784418 (Accessed: 13 December 2021).

- Granta. (2017) *Advantages and Disadvantages of Automation* [Online]. Available at: https://www.granta-automation.co.uk/news/advantages-and-disadvantages-of-automation/ (Accessed: 8 March 2021).

- Handwerk, B. (2021) An Evolutionary Timeline of Homo Sapiens, *Smithsonian Magazine*. Available at: https://www.smithsonianmag.com/science-nature/essential-timeline-understanding-evolution-homo-sapiens-180976807/ (Accessed: 16 May 2022).

- Hasdell, R. (2020) What we know about Universal basic Income: A cross Synthesis of Reviews, *Stanford Basic Income Lab*, (7/2020). Available at: https://basicincome.stanford.edu/uploads/Umbrella%20Review%20BI_final.pdf (Accessed: 30 September 2021).

- Hawken, P. (2018) Top 10 Solutions to Reverse Climate Change, *Green America*, 1 February. https://www.greenamerica.org/climate-change-100-reasons-hope/top-10-solutions-reverse-climate-change (Accessed: 28 October 2021).

- Hedonova (2020) *Invest in fine art worth millions*. Available at: https://www.hedonova.io/investments/art (Accessed: 29 October 2022).

- Hindi, N. (2020) An Artistic Mindset Is Fundamental for Business Leaders, *Insights*, 5 October. Available at: https://chimesnewspaper.com/25171/opinions/social-media-trivializes-our-lives/ (Accessed: 27 Jun 2022).

- Hobbs, C. (2020) Europe's digital sovereignty: From rulemaker to superpower in the age of US-China rivalry, *European Council On Foreign Relations*, 30 July. Available at: https://ecfr.eu/publication/europe_digital_sovereignty_rulemaker_superpower_age_us_china_rivalry/(Accessed: 26 August 2021).

- Holländer, B. (2018) Natural vs Artificial Neural Networks, *Medium*, 20 August. Available at: https://becominghuman.ai/natural-vs-artificial-neural-networks-9f3be2d45fdb (Accessed: 4 September 2021).

- Hom, E.J. (2014) What is STEM Education?, *LiveScience*, 11 February. Available at: https://www.livescience.com/43296-what-is-stem-education.html (Accessed: 5 October 2021).

- Horowitz, J. (2021) A global energy crisis is coming. There's no quick fix, *CNN Business*, 7 October. Available at: https://edition.cnn.com/2021/10/07/business/global-energy-crisis/index.html (Accessed: 28 October 2021).

- Invaluable. (2019) How Bauhaus Art Radically Changed the Modern Landscape, 20 March. Available at: https://www.invaluable.com/blog/bauhaus-art/ (Accessed: 10 November 2021).

- IPFS (2021) *The web of tomorrow needs IPFS today*. Available at: https://ipfs.io/ (Accessed: 29 December 2021).

- Jiehong, J. (2021) *The Art of Contemporary China*. London, United Kingdom: Thames & Hudson.

- John Hopkins Medicine (2021) Brain Anatomy and How the Brain Works. Available at: https://www.hopkinsmedicine.org/health/conditions-and-diseases/anatomy-of-the-brain (Accessed: 4 September 2021).

- Jolly, A. (2014) STEM vs. STEAM: Do the Arts Belong?, *EducationWeek*, 18 November. Available at: https://www.edweek.org/teaching-learning/opinion-stem-vs-steam-do-the-arts-belong/2014/11 (Accessed: 5 October 2021).

- Jordan, J. Ghin, M. (2006) (Proto-) Consciousness as a Contextually Emergent Property of Self-Sustaining Systems, *Mind and Matter*, 4(1), pp. 45-68.

- Kalms, M. Hacker, J. Mabbott, J. Lanfanconi, S. (2020) *30 Voices on 2030: The Future of Space*, KPMG Report, May 2020. Available at: https://assets.kpmg/content/dam/kpmg/au/pdf/2020/30-voices-on-2030-future-of-space.pdf (Accessed: 14 September 2021).

- Keough, K. M. (2013). *Black Mountain College 1933-1956: In Awe of the Absolute Form*. Honors thesis, Duke University. Available at: https://hdl.handle.net/10161/7790.

- Kleeman, J. (2021) Who wants to live forever? Big Tech and the quest for eternal youth, *TheNewStatesman*, 13 October. Available at: https://www.newstatesman.com/long-reads/2021/10/who-wants-to-live-forever-big-tech-and-the-quest-for-eternal-youth (Accessed: 19 October 2021).

- Konrath, S. (2020) Between burnout and the bends: Cascading crises have created a burnout epidemic, *Salon*, 6 June. Available at: https://www.salon.com/2020/06/06/between-burnout-and-the-bends-cascading-crises-have-created-a-burnout-epidemic/ (Accessed: 7 September 2021).

- Kuhn, D. (2010) What is Scientific Thinking and How Does it Develop?, *Handbook of Childhood Cognitive Development*, 2(1). Available at: https://www.tc.columbia.edu/faculty/dk100/faculty-profile/files/10_whatisscientificthinkingandhowdoesitdevelop.pdf (Accessed: 29 July 2022).

- Kurzweil, R. (2005) *The Singularity Is Near*. London, United Kingdom: Penguin Group.

- Laino, L. (2019) Mediocre is the New Amazing, *Thank You*, 11 April. Available at: https://medium.com/the-ascent/mediocre-is-the-new-amazing-3a691c8a3531 (Accessed: 26 October 2021).

- Lauzon, V. (2021) Quantum Computing – How does it scale?: https://vincentlauzon.com/2018/03/21/quantum-computing-how-does-it-scale/ (Accessed: 16 April 2021)

- Lavoie, R. Main, K. King, C. King, D. (2021) Virtual experience, real consequences: the potential negative emotional consequences of virtual reality gameplay, *Springer Link*, 25(1), pp. 68-81.

- Lee, S. (2021) The Facts On The Reverse Aging Process And Reversing Age, *Atlas Blog*, 25 February. Available at: https://atlasbiomed.com/blog/ageing-can-you-reverse-it/ (Accessed: 1 September 2021).

- Lenton, T.M. Rockström, J. Gaffney, O. Rahmstorf, S. Richardson, K. Steffen, W. Schellnhuber, H.J. (2019) Climate tipping points — too risky to bet against, *Nature*, 27 November. Available at: https://www.nature.com/articles/d41586-019-03595-0 (Accessed: 28 October 2021).

- Leontyev, G.D. and Leontieva L.S. (2020) Metaphysical Foundations of Alter-Globalization, *Utopía y Praxis Latinoamericana, 25(5), pp. 147-153.* https://doi.org/10.5281/zenodo.3984222

- Levy, S. (2018) What is a museum today?, *Artland*. Available at: https://magazine.artland.com/what-is-a-museum-today-sylvain-levy/ (Accessed: 16 November 2021).

- Levy, S. (2019) The Challenges Facing the Art World Today, *Artland*. Available at: https://magazine.artland.com/the-challenges-facing-the-art-world-today/ (Accessed: 16 November 2021).

- Li, J. (2021) *Cultural Foundations of Learning: East and West*. Cambridge, United Kingdom: Cambridge University Press

- Liu, R. (2020) Woke: The Dangers and Possibilities of Social Media Activism and Woke Washing, *Impakter*, 27 October. Available at: https://impakter.com/woke-the-dangers-and-possibilities-of-social-media-activism-and-woke-washing/ (Accessed: 8 September 2021).

- LIYSF (2021) *Future Impact of Nanotechnology*. Available at: https://www.liysf.org.uk/blog/future-impact-of-nanotechnology (Accessed: 2 September 2021).

- López de Mántaras, R. (2020) Artificial Intelligence and the Arts: Toward Computational Creativity, *OpenMind*, 20 April. Available at: https://www.bbvaopenmind.com/en/articles/artificial-intelligence-and-the-arts-toward-computational-creativity/ (Accessed: 25 November 2021).

- Lucero, E. (2021) Unveiling our new Quantum AI campus, *Google*, 18 May. Available at: https://blog.google/technology/ai/unveiling-our-new-quantum-ai-campus/ (Accessed: 10 August 2021).

- Lufkin, B. (2017) 50 grand challenges for the 21st Century, *BBC Future*, 1 April. Available at: https://www.bbc.com/future/article/20170331-50-grand-challenges-for-the-21st-century (Accessed: 24 September 2021).

- Lumen (2021) Group Dynamics. Available at: https://courses.lumenlearning.com/boundless-sociology/chapter/group-dynamics/ (Accessed: 17 December 2021).

- Lumen (2021) *Introduction to Art Concepts, SAC, ART100.* Available at: https://courses.lumenlearning.com/sac-artappreciation/chapter/oer-1-2/ (Accessed: 28 October 2021).

- Maldonado, D.V.H. (2019) What will art look like in 20 years?, *BBC Culture*, 23 April. Available at: https://www.bbc.com/culture/article/20190418-what-will-art-look-like-in-20-years (Accessed: 23 November 2021).

- Mangematin, V. and Walsh, S. (2012) The future of nanotechnologies, *Science Direct*, 32(3-4). Available at: https://www.sciencedirect.com/science/article/abs/pii/S0166497212000041 (Accessed: 2 September 2021).

- Manning, R.A. (2020) Emerging Technologies:New Challenges to Global Stability, *Atlantic Council*, (20/5). Available at: https://www.atlanticcouncil.org/wp-content/uploads/2020/06/Emerging-Technologies-New-Challenges-To-Global-Stability-May-2020.pdf (Accessed: 20 April 2021).

- Markoff, J. (2021) These Materials Could Make Science Fiction a Reality, *The New York Times*, 27 April. Available at: https://www.nytimes.com/2021/04/27/science/metamaterials-technology.html (Accessed: 3 September 2021).

- Marr, B. (2021) Future Predictions Of How Virtual Reality And Augmented Reality Will Reshape Our Lives*, Forbes*, 4 June. Available at: https://www.forbes.com/sites/bernardmarr/2021/06/04/future-predictions-of-how-virtual-reality-and-augmented-reality-will-reshape-our-lives/ (Accessed: 30 August 2021).

- Masterson, V. (2022) These 3 charts show the impact of war in Ukraine on global trade, *World Economic Forum*, 26 April. Available at: https://www.weforum.org/agenda/2022/04/ukraine-war-global-trade-risk/ (Accessed: 1 June 2022).

- Matthews, D. (2017) A new study debunks one of the biggest arguments against basic income, *VOX*, 16 September. Available at: https://www.vox.com/policy-and-politics/2017/9/20/16256240/mexico-cash-transfer-inflation-basic-income (Accessed: 14 June 2022).

- Mayr, E. (1997) The objects of selection, *PNAS*, 94(6): 2091—2094. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC33654/ (Accessed: 14 May 2022).

- McCord, B. Weinberg, Z.A. (2021) How the NSC can better tackle emerging technology threats, *Brookings*, 1 February. Available at: https://www.brookings.edu/techstream/how-the-nsc-can-better-tackle-emerging-technology-threats/ (Accessed: 26 October 2021).

- McFarland, M. (2019) Alphabet's plans to track people in its 'smart city' ring alarm bells, *CNN Business*, 9 July. Available at: https://edition.cnn.com/2019/07/09/tech/toronto-sidewalk-labs-google-data-trust/index.html (Accessed: 1 November 2021).

- McWilliams, A. (2018) How artists are reshaping emerging technology research, *Thoughtworks*, 27 June. Available at: https://www.thoughtworks.com/en-es/insights/blog/how-artists-are-reshaping-emerging-technology-research (Accessed: 24 November 2021).

- Miller, K. (2021) Radical Proposal: Universal Basic Income to Offset Job Losses Due to Automation, *HAI*, 20 October. https://hai.stanford.edu/news/radical-proposal-universal-basic-income-offset-job-losses-due-automation (Accessed: 14 June 2022).

- Mills, T. (2018) Virtual Intelligence Vs. Artificial Intelligence: What's The Difference?*, Forbes*, 27 March. Available at: https://www.forbes.com/sites/forbestechcouncil/2018/03/27/virtual-intelligence-vs-artificial-intelligence-whats-the-difference/?sh=74ab657d1cc0 (Accessed: 10 May 2021).

- Mineo, Liz. (2021) Racial wealth gap may be a key to other inequities, *The Hardvard Gazette*, 3 June.

Available at: https://news.harvard.edu/gazette/story/
2021/06/racial-wealth-gap-may-be-a-key-to-other-
inequities/ (Accessed: 29 October 2021).

- Mire, S. (2019) What's The Future Of Transportation?16
  Experts Share Their Insights, *Disruptor Daily*, 30 Jun.
  Available at: https://www.disruptordaily.com/future-
  of-transportation/ (Accessed: 14 September 2021).

- Mire, S. (2019) What's The Future Of Transportation?16
  Experts Share Their Insights, *Disruptor Daily*, 30 Jun.
  Available at: https://www.disruptordaily.com/future-
  of-transportation/ (Accessed: 14 September 2021).

- Modesta, M. Harbisson, N. Graafstra, A. (2020) How
  technology is changing what it means to be human,
  CNN, 3 March. Available at: https://edition.cnn.com/
  style/article/designing-bodies-future/index.html
  (Accessed: 25 November 2021).

- Muggah, R. Walton, G. (2021) 'Smart' Cities Are
  Surveilled Cities, *FP*, 17 April. Available at:
  https://foreignpolicy.com/2021/04/17/smart-cities-
  surveillance-privacy-digital-threats-internet-of-
  things-5g/ (Accessed: 26 October 2021).

- Muro, M. Maxim, R. Whiton, J. (2019) Automation and
  Artificial Intelligence: How machines are affecting
  people and places, *Brookings*. Available at: https://
  www.brookings.edu/research/automation-and-artificial-
  intelligence-how-machines-affect-people-and-places/
  (Accessed: 13 February 2021).

- Nalipay, M.J.N. King, R.B. Cai, Y. (2020) Autonomy is
  equally important across East and West: Testing the
  cross-cultural universality of self-determination
  theory, *Science Direct*, 78(1), pp. 67-72.

- Namazu, T. (2020) Nanoengineering Will Change the Future and How We Think*, Kyoto University of Advanced Science*, 2(1). Available at: https://www.kuas.ac.jp/en/faculty-of-engineering/faculty-and-research/research-highlights/nanoengineering-will-change-future-and-how-we-think/ (Accessed: 2 September 2021).

- National Academies of Sciences (NAS) (2016) *Genetically Engineered Crops: Experiences and Prospects*. Washington, DC: The National Academies Press.

- National Aeronautics and Space Administration (NASA) (2022) *Artemis.* Available at: https://www.nasa.gov/specials/artemis/ (Accessed: 25 September 2022).

- Nguyen, T. (2021) How subscriptions took over our lives, *VOX*, 29 April. Available at: https://www.vox.com/the-goods/22403782/subscription-boom-fatigue-content (Accessed: 26 October 2021).

- Nichols, S. (2015) *Bound: Essays on free will and responsibility*. Oxford, United Kingdom: Oxford Scholarship Online.

- Nigel Wright Group. (2018) *Automation and its impact on employment* [Online]. Available at: https://www.nigelwright.com/uk/automation-and-its-impact-on-employment (Accessed: 11 February 2021).

- Nowodziński, P. (2021) Sustainability Challenges, *MCX Group*, 1 April. https://mitefcee.org/sustainability-challenges/ (Accessed: 28 October 2021).

- Okamoto, G. (2021) Global Economy 2021: Prospects and Challenges, *International Monetary Fund*, 20 March. Available at: https://www.imf.org/en/News/Articles/2021/03/20/sp-global-economy-2021-prospects-and-challenges (Accessed: 19 October 2021).

- Open AI Group (2021) *Presentation*. Available at: https://openai.com/about/ (Accessed: 12 August 2021).

- Open AI Group (2022) *Dall.E 2.* Available at: https://openai.com/dall-e-2/ (Accessed: 30 Jun 2022).

- Organisation for Economic Co-operation and Development. (2020) The future of education and skills, Education 2030, *OECD*. Available at: https://www.oecd.org/education/2030-project/about/documents/E2030%20Position%20Paper%20(05.04.2018).pdf (Accessed: 5 October 2021).

- Ota, S. Mäki-Teeri, M. Stucki, M. (2020) 12 Trends That Will Drive the Future of Transport, *Future Proof Blog*, 29 May. Available at: https://www.futuresplatform.com/blog/12-trends-will-drive-future-transport (Accessed: 14 September 2021).

- Overton, T. (2020) Fusion Energy Is Coming, and Maybe Sooner Than You Think, *POWER*, 1 Jun. Available at: https://www.powermag.com/fusion-energy-is-coming-and-maybe-sooner-than-you-think/ (Accessed: 3 September 2021).

- Patil, T. (2020) Understanding the Difference Between Eastern & Western Culture, *Medium*, 3 June. Available at: https://medium.com/@tanmaynitinpatil/understanding-the-difference-between-eastern-western-culture-d20f94dbf956 (Accessed: 8 September 2021).

- Pearce, F. (2021) Geoengineer the Planet? More Scientists Now Say It Must Be an Option, *Yale School of the Environment*, (29/5). Available at: https://e360.yale.edu/features/geoengineer-the-planet-more-scientists-now-say-it-must-be-an-option (Accessed: 4 September 2021).

- Pelley S. (2021) Whistleblower: Facebook is misleading the public on progress against hate speech, violence, misinformation, *60 Minutes*, 4 May. Available at: https://www.cbsnews.com/news/facebook-whistleblower-frances-haugen-misinformation-public-60-minutes-2021-10-03/ (Accessed: 11 October 2021).

- Phillips, K.U. (2020) *The Future of Feeling: Building Empathy in a Tech-Obsessed World*. Seattle: Little A. Available at: http://www.millennium-project.org/state-of-the-future-version-19-1/ (Accessed: 15 April 2021).

- Phillips, R. (2018) The problem with "woke" culture, *The Daily Northwestern*, 13 February. Available at: https://dailynorthwestern.com/2018/02/13/opinion/phillips-problem-woke-culture/ (Accessed: 8 September 2021).

- Pinn, A.B. (2019) *The Oxford Handbook of Humanism*. Oxford, United Kingdom: Oxford Handbooks Online. Available at: https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780190921538.001.0001/oxfordhb-9780190921538 (Accessed: 29 June 2022).

- Plavevski, A. (2021) China's 'surveillance creep': how big data COVID monitoring could be used to control people post-pandemic, *The conversation*, 31 August. Available at: https://theconversation.com/chinas-surveillance-creep-how-big-data-covid-monitoring-could-be-used-to-control-people-post-pandemic-164788 (Accessed: 15 June 2022).

- Poetranto, I. Ruan, L. (2021) Intrusive Surveillance After the Coronavirus Pandemic, *Carnegie*, 19 October. Available at: https://carnegieendowment.org/2021/10/19/intrusive-surveillance-after-coronavirus-pandemic-pub-85509 (Accessed: 15 June 2022).

- Pomares, J. Abdala, B. (2018) Global Governance in 2030, Prospective Scenarios on the Future of Politics, *CIPPEC*, (30/11). Available at: https://www.cippec.org/wp-content/uploads/2018/10/Global-Governance-in-2030.pdf (Accessed: 22 October 2021).

- Price-water House Coopers. (2017) *How will automation impact jobs?* [Online]. Available at: https://www.pwc.co.uk/services/economics/insights/the-impact-of-automation-on-jobs.html (Accessed: 16 February 2021).

- Ranger, S. (2020) What is the IoT? Everything you need to know about the Internet of Things right now, *ZDNet*, 3 February. Available at: https://www.zdnet.com/article/what-is-the-internet-of-things-everything-you-need-to-know-about-the-iot-right-now/ (Accessed: 11 August 2021).

- Reality Check team. (2019) Does 5G pose health risks?, *BBC*, (July). Available at: https://www.bbc.com/news/world-europe-48616174 (Accessed: 27 April 2021).

- Rice, J.A. (1942) *I Came Out of the Eighteenth Century*. New York City, New York: Harper and Brothers

- Rose, E. (2020) The greatest contest ever — privacy versus security, *Computer Weekly*, 21 February. Available at: https://www.computerweekly.com/opinion/The-greatest-contest-ever-privacy-versus-security (Accessed: 26 October 2021).

- Russell, B. (1926) *On Education, especially in early childhood*. London, United Kingdom: Routledge.

- Russell, B. (1947) Am I An Atheist Or An Agnostic? A Plea For Tolerance In The Face Of New Dogmas,

Positive Atheism. Available at: http://
www.positiveatheism.org/hist/russell8.htm (Accessed:
10 May 2022).

- Saatchi, C. (2009) *My Name Is Charles Saatchi And I
  Am An Artoholic: Everything You Need To Know About
  Art, Ads, Life, God And Other Mysteries And Weren't
  Afraid To Ask*. New York, NY: Phaidon.

- Santens, S. (2014) Wouldn't Unconditional Basic Income
  Just Cause Massive Inflation?, *Medium*, 22 November.
  Available at: https://medium.com/basic-income/wouldnt-
  unconditional-basic-income-just-cause-massive-
  inflation-fe71d69f15e7 (Accessed: 14 June 2022).

- Santikary P. (2019) Artificial Intelligence and
  Machine Learning: Part 1 — Definitions, Similarities
  and Differences, *ERT Blog*, 19 September. Available
  at: https://www.ert.com/blog/artificial-intelligence-
  and-machine-learning-part-1-definitions-similarities-
  and-differences/ (Accessed: 4 April 2021).

- Savage N. (2020) The race to the top among the
  world's leaders in artificial intelligence, *Nature*, 9
  December. Available at: https://www.nature.com/
  articles/d41586-020-03409-8 (Accessed: 16 June 2022).

- Schwabsky, B. (2020) What Are Art Galleries For?, *The
  Nation*, 1 July. Available at: https://
  www.thenation.com/article/culture/future-of-
  galleries/ (Accessed: 16 November 2021).

- Segal, E.A. (2019) Power Blocks Empathy, *Phycology
  Today*, 23 September. Available at: https://
  www.psychologytoday.com/us/blog/social-empathy/
  201909/power-blocks-empathy (Accessed: 21 October
  2021).

- Serres, M. (1991) *El paso del Noroeste*. Madrid, Spain: Editorial Debate

- Shanahan, M. (2015) The Technological Singularity, *MIT Press*, (2015/1), pp. 233.

- Siegel, E. (2021) How Close Are We To The Holy Grail Of Room-Temperature Superconductors?, *Forbes*, 7 July. Available at: https://www.forbes.com/sites/ startswithabang/2021/07/07/how-close-are-we-to-the-holy-grail-of-room-temperature-superconductors/ (Accessed: 3 September 2021).

- Smit, S. Tacke, T. Lund, S. Manyika, J. Thiel, L. (2020) The future of work in Europe: Automation, workforce transitions, and the shifting geography of employment, *Mackinsey Global Institute*, 20 June. Available at: https://www.mckinsey.com/~/media/ mckinsey/featured%20insights/ future%20of%20organizations/ the%20future%20of%20work%20in%20europe/mgi-the-future-of-work-in-europe-discussion-paper.pdf (Accessed: 19 October 2021).

- Snyder, B.F. (2020) The genetic and cultural evolution of unsustainability, *Springer Link*, 15(1), pp. 1087—1099.

- Solar Impulse Foundation (SIF) (2021) *How to stop climate change?.* Available at: https:// solarimpulse.com/climate-change-solutions# (Accessed: 28 October 2021).

- Sotheby's Institute of Art (SIA) (2022) The Role of the Art Advisor, *Insights*, 5 October. Available at: https://sothebysinstitute.com/news-and-events/news/ the-role-of-the-art-advisor (Accessed: 12 July 2022).

- Spurling, B. (2020) The peril of modern democracy: Short-term thinking in a long-term world, *United States Studies Centre*, 3 February. Available at: https://www.ussc.edu.au/analysis/the-peril-of-modern-democracy-short-term-thinking-in-a-long-term-world (Accessed: 21 October 2021).

- Stanford News (2008) *Human culture is subject to natural selection, researchers at Stanford find.* Available at: https://news.stanford.edu/news/2008/february20/ehrlich-022008.html (Accessed: 17 May 2022).

- Stefan, L. (2021) Why Can't Europe Cope With the Coronavirus?, *Carnegie Europe*, 8 April. Available at: https://carnegieeurope.eu/strategiceurope/84286 (Accessed: 11 December 2021).

- Steffes-Halmer, A. (2021) Hong Kong's new M+ museum accused of censorship, *DW News*, 11 November. Available at: https://www.dw.com/en/hong-kongs-new-m-museum-accused-of-censorship/a-59790506 (Accessed: 24 November 2021).

- Stokel-Walker, C. (2020) How China could shape the future of technology, *Future INC*, 19 November. Available at: https://www.bbc.com/future/article/20201117-how-china-social-media-apps-are-changing-technology (Accessed: 11 October 2021).

- Straubhaar, T. (2017) On the Economics of a Universal Basic Income, *Intereconomics*, 2(1), pp. 74—80. https://www.intereconomics.eu/contents/year/2017/number/2/article/on-the-economics-of-a-universal-basic-income.html (Accessed: 14 June 2022).

- Strelkova, O. Pasichnyk, O. (2017) Three Types Of Artificial Intelligence, *Khmelnitsky National University*, (2017/1), pp. 142-146.

- Taleb, N.N. (2010) *The Black Swan: The Impact of the Highly Improbable*, N.Y.: Random House Publishing Group. (Accessed: 20 December 2019).

- Tangermann, V. (2021) *NASA Employee Says SpaceX's Starship Is About to Change Everything*, 28 October. Available at: https://futurism.com/nasa-employee-spacex-starship/amp (Accessed: 14 September 2021).

- Thales Group. (2020) 5G vs 4G: what's the difference?, *Thales Magazine*, (October). https://www.thalesgroup.com/en/worldwide-digital-identity-and-security/mobile/magazine/5g-vs-4g-whats-difference (Accessed: 26 April 2021).

- The Economist Intelligence Unit. (2018) *The Automation Readiness Index* [Online]. Available at: https://www.automationreadiness.eiu.com/ (Accessed: 11 February 2021).

- The Economist. (2021) Why the COP26 climate summit will be both crucial and disappointing, 30 October. https://www.economist.com/leaders/2021/10/30/why-the-cop26-climate-summit-will-be-both-crucial-and-disappointing (Accessed: 2 November 2021).

- The Guardian (2021) *World's 'oldest known cave painting' found in Indonesia*, 13 January. Available at: https://www.theguardian.com/science/2021/jan/13/worlds-oldest-known-cave-painting-found-in-indonesia (Accessed: 30 Jun 2022).

- The Millennium Project Team (2021) *15 Global Challenges*. Available at: http://www.millennium-project.org/projects/challenges/ (Accessed: 15 April 2021).

- The World Bank (TWB) (2020) *Pricing Carbon.* Available at: https://www.worldbank.org/en/programs/pricing-carbon (Accessed: 22 June 2022).

- Thompson, D. (2010) *The $12 Million Stuffed Shark: The Curious Economics of Contemporary Art.* New York, NY: St. Martin's Griffin.

- ThreeKit (2020) 20 Augmented Reality Statistics You Should Know in 2021: https://www.threekit.com/20-augmented-reality-statistics-you-should-know-in-2020 (Accessed: 3 May 2021).

- Tokita, C.K. Tarnita, C.E. (2020) Social influence and interaction bias can drive emergent behavioural specialization and modular social networks across systems, *The Royal Society*, (17/162). Available at: https://doi.org/10.1098/rsif.2019.0564 (Accessed: 4 October 2020).

- United Nations Educational, Scientific and Cultural Organization (UNESCO) (2021) *World Inequality Database on Education.* Available at: https://www.education-inequalities.org/ (Accessed: 5 November 2021).

- Ünver H.A. (2018) Artificial Intelligence, Authoritarianism and the Future of Political Systems, *Centre for Economics and Foreign Policy Studies,* (2018/7). Available at: https://www.jstor.org/stable/resrep26084 (Accessed: 19 February 2021).

- Valanides, C. (2019) Intelligence Augmentation: The evolution and the future of Artificial Intelligence*, KPMG*, 13 September. Available at: https://home.kpmg/cy/en/home/insights/2019/09/intelligence-augmentation-the-evolution-and-the-future-of-artificial-intelligence.html (Accessed: 1 September 2021).

- Valsangiacomo, C. (2021) Political Representation in Liquid Democracy, *Frontiers*, (26/3). Available at: https://www.frontiersin.org/articles/10.3389/fpos.2021.591853/full (Accessed: 21 October 2021).

- View Sonic. (2021) STEAM Education: Preparing All Students for the Future, *ViewSonic*, 7 January. Available at: https://www.viewsonic.com/library/education/steam-education-preparing-all-students-for-the-future/ (Accessed: 5 October 2021).

- Vinge, V. (1993) The Coming Technological Singularity: How to Survive in the Post-Human Era, *Mindstalk*, 1 December. Available at: https://mindstalk.net/vinge/vinge-sing.html (Accessed: 19 April 2022).

- Wang, Y. (2021) From Covid to Blackface on TV, China's Racism Problem Runs Deep, *Human Rights Watch*, 18 February. Available at: https://www.hrw.org/news/2021/02/18/covid-blackface-tv-chinas-racism-problem-runs-deep (Accessed: 30 October 2021).

- Wang, Y. Kwong, S. Lu, J. Smith, M. Trajkovic, L. Tunstel, E. Plataniotis, K. Yen, G. Kinsner, W. (2020) Brain-Inspired Systems: A Transdisciplinary Exploration on Cognitive Cybernetics, Humanity, and Systems Science Toward Autonomous Artificial Intelligence, *IEEE*, 6(1). Available at: https://ieeexplore.ieee.org/abstract/document/8960591/authors#authors (Accessed: 1 September 2021).

- Watson, J.L. (2020) Cultural Globalization, *Britannica*, 4 November. Available at: https://www.britannica.com/science/cultural-globalization (Accessed: 26 October 2021).

- Weaver, N. (2021) The Web3 Fraud*, Usenix*, 16 December. Available at: https://www.usenix.org/publications/loginonline/web3-fraud (Accessed: 30 December 2021).

- Weiner, Y. (2018) 39 Ways AR Can Change The World In The Next Five Years, *Medium*, 5 January. Available at: https://medium.com/thrive-global/39-ways-ar-can-change-the-world-in-the-next-five-years-a7736f8bfaa5 (Accessed: 26 August 2021).

- Winton, A.G. (2016) The Bauhaus, 1919—1933, *MET*, 1 October. Available at: http://search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=bwh&AN=149911278&scope=site (Accessed: 10 November 2021).

- *Wired* (2018) The Future of Art, 7 July. Available at: https://www.wired.com/brandlab/2018/07/the-future-of-art/ (Accessed: 25 November 2021).

- WMT Team (2019) 9 Amazing Future Materials | #9 is REALLY scary, *Wisconsin Metal Tech Blog*, 2 January. Available at: https://wisconsinmetaltech.com/9-amazing-future-materials/ (Accessed: 4 September 2021).

- World Economic Forum (2021) *Global Gender Gap Report* (WEF 15-2021). Geneva: World Economic Forum.

- WPR Board Of Editors. (2020) What's Driving the Rise of Authoritarianism and Populism in Europe and Beyond?, *World Politics Review*, 11 September. Available at: https://www.worldpoliticsreview.com/insights/27842/the-rise-of-authoritarianism-and-populism-europe-and-beyond (Accessed: 21 October 2021).

- Wu, J. (2019) Empathy in Artificial Intelligence, 17 December. Available at: https://www.forbes.com/sites/cognitiveworld/2019/12/17/empathy-in-artificial-intelligence/?sh=213553e46327 (Accessed: 16 June 2022).

- Yakman, G. (2008) ST∑@M Education:an overview of creating a model of integrative education, *Academia.edu*, 3(2008). Available at: https://www.academia.edu/8113795/STEAM_Education_an_overview_of_creating_a_model_of_integrative_education (Accessed: 18 October 2021).

- Yakman, G. (2017) STEAM Education Professional Development Practicum & Research, *Academia.edu*, 1(2017). Available at: https://www.academia.edu/33856478/STEAM_Education_Professional_Development_Practicum_and_Research (Accessed: 18 October 2021).

- Yang, W. (2018) How China is trying to export its soft power, *DW*, 4 May. Available at: https://www.dw.com/en/how-china-is-trying-to-export-its-soft-power/a-43266193 (Accessed: 11 October 2021).

- Yoscovits, Z. (2009) *Memetics: The Evolution of Culture*. Available at: https://guava.physics.uiuc.edu/~nigel/courses/569/Essays_Fall2009/files/yoscovits.pdf (Accessed: 14 May 2022).

- Young, R. (2020) What's Driving the How Power Erodes Empathy, And The Steps We Can Take To Rebuild It, *wbur*, 9 July. Available at: https://www.wbur.org/hereandnow/2020/07/09/jamil-zaki-empathy-power (Accessed: 21 October 2021).

- Yun, J. (2016) Social media trivializes our lives, *The Biola university*, 26 October. Available at: https://chimesnewspaper.com/25171/opinions/social-media-trivializes-our-lives/ (Accessed: 26 October 2021).

- Zallo, R. (2012) *Estructuras de la comunicación y la cultura: Políticas para la era digital*. 1. Barcelona, Spain: GEDISA.

- Zallo, R. (2016) *Tendencias en comunicación: Cultura digital y poder*. 1. Barcelona, Spain: GEDISA.

- Zarrin, J. Phang, H.W. Saheer, L.B. Zarrin, B. (2021) Blockchain for decentralization of internet: prospects, trends, and challenges, *ClusterCompute*, 24(1), pp. 2841–2866. Available at: https://link.springer.com/article/10.1007/s10586-021-03301-8#citeas (Accessed: 28 December 2021).