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UNIVERSIDADE Ð COIMBRA

Rodrigo de Sousa Neves

"SYMBOLIC NATURE": REINFORCING FEELINGS OF CONNECTEDNESS THROUGH A MULTIMEDIA ART INSTALLATION

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"Symbolic Nature": reinforcing feelings of connectedness through a multimedia art installation

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Advised by:
Prof. Licínio Roque
Prof. Pedro Martins

Rodrigo de Sousa Neves | rdneves@student.uc.pt
2017258125

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Abstract

This project consists of a multimedia art installation titled "Symbolic Nature" that seeks to reinforce feelings of connectedness among humans and between humans and nature as a whole through a multi-sensory experience. Combining elements of video, sound, and environment design, the installation creates an immersive environment that aims to evoke an emotional response in the participant. By exploring themes related to ecological awareness, mysticism, and biomimicry, this installation seeks to encourage visitors to reflect on their own relationship with nature and their role in preserving it.

Overall, this multimedia art installation seeks to create a contemplative experience that encourages visitors to reflect on their relationship with nature and reinforce the interconnectedness of all living beings. It seeks to spark discussion of key topics such as sustainability of human civilization, meditation, non-duality, entheogens, sacredness, community, or spirituality and has the potential to offer a setting capable of transformative experiences.

The resulting multimedia artifact and the experience it triggers has the potential to be used in educational settings, parks, and gardens or as festival installations. The key message and the type of experience it triggers in the participants have the potential to be used by many parties, organizations, and institutions, and although the motivations may differ, the installation has the potential to be a flexible solution to the various needs of such entities such as psychological grounding, eco-literacy, holistic thinking, and sustainability.

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1. Introduction

In a general way, the sacred has been misunderstood for the last hundred years of the Western world and is in danger of being forgotten, ridiculed, and perverted, and with it our own deeper connections to nature, each other, and even ourselves (Ives et al, 2018; Fletcher, 2017; York, 2001). We can keep the spark of humbleness, kindness, and communication alive in each of us, and that is what this project seeks to encourage. It is the very message being embodied into the experience that will result from the creation of this art installation, and one that aims to help us overcome a period of closedness and fear fueled by recent events such as COVID (Kathirvel, 2020), wars, mass migration or environmental crisis (McRae, et al., 2016).

This proposal seeks to create an audiovisual involving experience that seeks to raise certain questions and to move humans into a more harmonious state with nature and themselves. The new media art experience will make use of various video projectors, ready-made, banners, and a surround audio system in order to immerse the user into an evolving, mysterious, calm environment where the illusion of separation is played with, questioned and explored, planting the seed in the visitor of their connectedness with everything.

The main function of this document is the documentation of the process of conceiving and creating the installation and the findings that resulted from that process. Another function of this document is to aid the understanding of the conceptual basis for the installation. This means that this document will hopefully answer the questions that someone who experienced the installation may have.

In the *Scope* chapter, we will establish the groundwork for the rest of the document both conceptually, scientifically, and artistically. It starts with the author's motivations and artistic concept. Then it covers the groups, organizations, and individuals to whom this project may be of interest. It will also go over humans, nature and all the in-betweens explored, ending with the proposal outline.

The *State of the Art* chapter will cover three fronts. The section *Related works* features projects that are similar both visually and also conceptually and their relation and influence to this project will be explained. The goal of this section is to expose other attempts to address the issue at hand, where they succeeded, and where they stood short. *Natural structures and Designs* is next, where the harmony of these shapes is explored and learning opportunities are shared. And then we will cover *Sound and healing* where the information about music, sound, vibration, and frequency is shown, as well as cover how certain techniques of using sound have been used to aid relaxation, altered states or healing.

The *Work plan and methodology* chapter covers how the development was initially planned and how it went during the process. It will outline a Gantt chart and a design process that was used as a guideline for the development process of this project. The work plan suffered a change, by delaying the final delivery from September to January in order to have a solid artifact for proper evaluation.

The *Conceptual Development* chapter seeks to firstly define a problem and will then clarify the conceptual, philosophical, and abstract motifs — such as non-duality, mysticism, and visionary art — behind the experience. It will also explain how these concepts are connected and how they shaped the final artifact.

In the *Development of the Installation* chapter, it will be documented how the production of the artifacts came to be, the process, the problems, the solutions, and the findings. How the translation from a concept into a multimedia object was created. It also contains schematics and guidelines for assembling the installation.

On *Experience Evaluation*, the formal tests are outlined. How they were prepared, how they were conducted, the resulting data, and the careful analysis of that data. This is where the most amount of information about the experience is found, which is very helpful for future improvements.

Lastly, we will finish with the *Conclusions and future prospects*, where an overall reflection on the materialization, the quality, and the evaluation results in order to paint a general picture of the project's results, strengths, and weaknesses. It will then cover some of the future prospects for Symbolic Nature.

2. Scope

This chapter will start with the *Artist Statement*, where the more personal motivations of the author are laid down in order to clear any questions regarding the motivation and also to clarify the concepts associated with the development of this project. This text also serves to give room for emotional motivation to be transmuted into a useful statement that also attempts to reduce the occurrence and length of motivational and philosophical tangents for choices throughout the document. Following the statement, the facts and science regarding humans and nature are going to be presented, and there will be established what constitutes both and what their main differences and similarities are. The context will also explain the paradigm that this installation finds itself in, and propose a design for societal transition through art. Last but not least, the people to whom this project may interest will be mentioned as to why it may be relevant to them.

2.1 Artist Statement

Are you at peace? Are you mindful? Do you have hope for the future? Are you suffering? Do you fear disease and death? These are some of the deep existential questions that are extremely relevant for our personal lives, our collective life, as well as our sense of purpose and meaning as we move through this violent, chaotic yet beautiful, and magnificent reality. We have been collectively numbing ourselves from these questions, numbing ourselves from the chaos of modern society, and that is leading to catastrophic results (Kathirvel, 2020; Aruguete, 2020; Javanbakht, 2020). Extreme confusion, consumerism, narcissism, addiction, paranoia, anxiety, and tribalism are symptoms of this attempt to numb ourselves, dividing us further, and creating hate, tension, resistance, and suffering. Slowly, we have been forgetting our roots of community, love, and sacredness. Blinded by tribalism, ideological possession, dogmatic religion, extreme reductionism, materialism, scientism, and rationalism, we have collectively forgotten why we are here, and why humanity keeps pushing forward. We forgot to dance, to sing, to feel, to enjoy, to tell old tales and myths. We forgot our inner child, to celebrate and care, that nature is our origin, that we are but an extension of her, and that we deep down all love her, for she is our mother. We forgot — and sometimes worse: banalize and ironize — the fundamental truths of Peace and Love.

Mass-spread anxiety, fear, confusion, and hate have become too prevalent to ignore. The illusion of division, mostly enforced by the media (Javanbakht, 2020), is destroying whole communities and our relation to Gaia (Aruguete, 2020). Gaia being the mythological representation of our planet as an entity, an organism that we are part of. We are, in essence, cells in organs of the organism that is planet Earth (Lovelock, 2016). Our sense of connection to our shared humanity and Gaia is fundamental. A sense of connection of such magnitude helps one experience meaning and belonging but also helps harmonize human civilization. We are not our nations, our football clubs, our skin color, our sexuality, or our religions. We are not our political parties, nor the brands we buy, or the music we listen to. We are human. It is true that we should celebrate our differences, but right now, we are in need of serious planetary-scale social cohesion, and that will require us to think globally and to act locally as the saying goes; to see our similarities instead of seeing our separateness. To choose love over hate.

We are now at a critical point in not only human history but the history of the whole planet. The speed at which technology is being developed, the population numbers, and the environmental impact are all growing at alarming rates (Ekins & Gupta, 2019; McRae et al., 2016). We have to act, but we do not really know how, or where to focus. Scientific knowledge regarding our issues is extensive, but the real-world applications by governments and politicians has not been enough. Every solution appears like a quick patch on a sinking ship. We must go deeper and ask ourselves *"what are we doing? what for?"*. We must go deeper into our own minds and hearts to reconnect with the fundamental values that got us here in the first place: love, community, sacredness, justice, peace, and progress.

No solution is good if we can not apply it. No solution is good if we keep allowing the system to be as it is, only changing superficial things (as it was done with the action of cutting down on plastic straws, for example). Governments have the total power to employ educational measures to prepare people for the global situation we find ourselves in. We must teach people to consume less, to be frugal, repair more, and to grow food locally. The right to repair, forbidding planned obsolescence, banning single-use plastics, and other market-related actions must be implemented as soon as possible. Governments have the power and therefore have the responsibility to prioritize education, sustainability, healthcare, and culture, instead of mass corporations, consumerism, and wars; this means all governments because the planetary issues we are facing do not care about our concepts of borders and nations. To add to this, governments must not forbid the access or use of natural plants and fungi that are healing and are part of the spirituality of many people as a matter of basic human rights.

No solution is good if we only change our actions because it is trendy or because we fear the peer pressure of the masses. If we do not honestly and deeply feel for the planet and our shared humanity, no amount of effort will suffice. The intention is key, and if we do not focus on truly believing and embracing a given solution then our actions will be less efficient or even ineffective. Because the solution for this mess we find ourselves in is not practical, technical nor physical; it is perceptual and spiritual — although of course, it will also manifest itself in certain physical forms such as new forms of cleaner and harmonious technology, reorganizations of communities, markets, governing systems, and living spaces and cities.

It is not that we do not have the power or technology. The problem is that we do not yet have the necessary humbleness, the wisdom, and the holistic perspective (Crocker, 2022). That is why our efforts have been amounting to little, even though we are at a peak of our technological, scientific, and social progress. That and the fact that our problems are becoming more complex, because we try to fix problems with more complex solutions, instead of slowing down and simplifying (Agyepong et al., 2012). The solution will have to include a global shift from duality into non-duality; from seeing ourselves as individuals to seeing ourselves as communities, social organs, and a single, whole planetary organism, the previously mentioned Gaia. It is not implied that we completely give up our sense of identity and individuality, but that this non-dual perspective gets more present in the collective consciousness to allow more compassion and cooperation into our ways of being.

It is crucial that the reader clears their mind from any preconceptions and assumptions they might have about the word "spiritual". We should stop and recognize the amount of emotional charge, division, and confusion that such a term carries. There is a considerable risk by mentioning anything "spiritual" or "mystical", but it just so happens the case being made with this dissertation is that these things are real phenomena with huge scientific, cultural, historical, political, social, and medical implications (Crocker, 2022; Fales, 1996; Mikosz, 2015; Pahnke & Richards, 1966).

Spiritual here refers to things such as sense of purpose, meaning, sacredness, reverence, gratitude, virtue, and justice or the practices that deal with exploring and healing our minds, bodies, and "spirits" through meditation, contemplation, introspection, empathy, service to others, celebration, dance, ceremony, entheogens, community, symbology, psychology, breathwork, intentionality, exercise, yoga, tai-chi, etc (Delaney, 2005). Some people will debate the existence and mechanisms of the "spirit", "souls" or God, but that will not be the focus of this dissertation. The concept of spirituality as explored here deals with our direct experience of reverence, unity, and flow with the rest of the universe, highly subjective experiences that are important to our overall well-being and which have been downplayed and ridiculed.

The Council on Spiritual Practices (CSP) is a collaboration of spiritual guides, experts in the behavioral and biomedical sciences, and scholars of religion, whose goal is to make direct experiences of the sacred more accessible to more people. CSP has a twofold mission: to identify and develop safe and effective approaches to primary religious experiences and to assist individuals and spiritual communities in integrating the insights and joy gained from direct experience of the divine into daily life. It is a great source of information that offers a pragmatic approach to spirituality (About CSP, 2019).

So, as said, the solution is spiritual; mystical. There is more to this life and this universe than what the materialistic and reductionistic cosmovision suggests. The thing is that not everyone describes themselves as spiritual (Walach & Reich, 2005), because of connotations and assumptions about the meaning of the word; this is perfectly fine, and we should respect different beliefs and ways of identifying oneself while remembering the imperfections of language. But the truth is that every human has a spiritual aspect in them, for every human deals with their sense of meaning, love, connectedness, sacredness, etc., and because every human can get in touch with this dimension of their being, because a mystical experience can happen to anyone at any time, with practice or spontaneously (Kaelen et al., 2018); it is always there, like a piece of code waiting to be run. The reconnection to this dimension of being is of the utmost importance, and we must not allow dogmatic and manipulatory/old-fashioned stances to destroy the inner world of our spiritual nature. Sacredness and the sublime can be experienced. And not only that, they are likely among the most important types of experiences for human well-being. They come in different intensities and the techniques for communing with the divine differ from dancing, chanting, fasting, meditation, entheogens, or just on daily affairs, by stopping and recognizing the divinity in the very here and now (Mikosz, 2015; Winkelman, 1989).

Many people reject spirituality and mysticism because of extremists in these communities. Every community has loud or obnoxious minorities, we must not allow them to stop us from discovering our inner spirituality. Many spiritual circles are also known to have a lot of spiritual ego and holier-than-thou attitudes, or it may attract scammers and other problems (Caplan, 2009). It is also fair to criticize New Age spirituality, as some of its members have been disrespecting symbols, rituals, and techniques from different traditions, by using them without proper understanding of their essence or their cultural context (York, 2001); this leads to a childish display of spirituality, where

the aesthetics are overvalued. The line between serious, respectful use of Eastern, indigenous and shamanic practices and symbols and what some call "cultural appropriation" is thin. Or it can also be criticized for promoting pseudoscientific practices, such as crystal healing or channeling. Still, New Age — a decentralized cultural movement, usually associated with the hippies but in truth way more broad and complex seeking the so-called "New Age" of humanity through spiritual awakening — is in general the revival of the true spiritual quest in each of us: because this movement focuses mostly on the reconceptualization that encourages more fruitful comparative historical and ethnographic analyses (Sutcliffe, 2003); by looking for patterns and recurring topics/symbols/archetypes and practices across different schools of wisdom and cultures, they can more accurately focus on the most relevant teachings and practices but also confirm that they may be about something objective. This is the so-called Perennial wisdom, the underlying truth of our spiritual aspect and experience; the closest thing to "objective" regarding the spiritual dimensions of being. Also similar to the concept of eclecticism, where we try to reconcile distinct and even opposite ideas into one better approximation of truth, although we should be careful with the "argument to moderation" fallacy when doing so.

Many people also reject these phenomena because of a lack of belief. Well, many spiritual practices have been scientifically proven to be mentally and physically good for the individual, for example, yoga (Mohammad et al., 2019), meditation (Millière et al., 2018) or tai-chi (Lan et al., 2013), among others. Many people will say that this is just science — and in a way it is — but that is highly disrespectful towards the cultures that have developed these techniques. They are better described as spiritual techniques which have been scientifically proven. Just because they have some of their mechanisms understood, explained and their efficacy proven, does not mean they are not spiritual anymore. We must note that science and spirituality are not mutually exclusive (Dennis, 2010; Walach & Reich, 2005) and start considering the idea that science and spirituality will eventually merge as they both have the same ultimate goal of understanding the cosmos and our place in it. In truth, there is untapped potential in using spirituality as a means to orient people towards nature (Ives, et al., 2018). It has been only very recently that science and spirituality have begun to work more harmoniously, and therefore it is normal that there is little knowledge about what those implementations may be and how they can be achieved. Nonetheless, there is great potential for the scientific community to explore deeper aspects of human nature such as spirituality.

Belief and intentionality are also key aspects of spirituality. But we have become too rational and logical to make use of these tools. We strongly follow the concept of *"We'll believe it when we see it"* and have lost our capacity to *"See when we believe"*. It should be clear that it is not implied that we should not drop skepticism altogether — it is a good tool to keep us from adopting flawed or delusional stances — but the truth of the matter is that mindset, belief and emotions can shape our bodies — as demonstrated by the phenomenon of the placebo effect (Placebo Effect, 2020) or the physical effects of stress (Tawakol et al., 2017) or psychosomatic illness. So, belief and intention are not so pseudoscientific as they are made to be, although they can definitely be overused, misused, and even misunderstood, and are the doorway for some

people to become victims of fake gurus and cult leaders. More research is needed regarding the power of belief, as we are only scratching the surface of what is possible, as well as a less dismissive attitude towards people who have experienced help through belief.

To exploit the placebo effect, one must not doubt their power and skill to achieve the desired effect but must trust and believe. This is why it is harder for overly logical and skeptical people to make use of this mechanism: because by adopting the skeptical approach instead of a faith-based approach, it undermines the result, as one of the requirements for the reproducibility of this phenomenon is, by definition, the inner world of a person: their mind, their emotions, their intentions and beliefs (Placebo Effect, 2020). It is important to stress that because this effect can help with health conditions, it has kept and will keep on leading many people to try and self-heal without consulting with a doctor. This is extremely dangerous and it should be reminded that no attempt to heal with alternative medicine alone should be done without consulting with one's doctor. They are best used as complements to modern Western medicine. What makes certain things medicinal, isn't always in the scientifically proven efficacy, but the way the person perceives their healing, their beliefs (Delaney, 2005). But in short, people will hardly feel the benefits of spiritual practices if they try them with a heavily skeptical mindset engaged, so, an open mind is fundamental to replicate the phenomena. This is literally a leap of faith – which does not sit right with a 21st-century Western scientific worldview – that we must take individually and collectively. If we are to make use of it at this critical point in time. In a way, the acknowledgment by the scientific community of the efficacy of the placebo effect, music therapy, meditation, yoga, acupuncture, and other forms of holistic and alternative healing that were once labeled "pseudo-scientific" is a step towards that leap of faith.

We are in a decisive period in humanity's history. The current period of our collective history is marked by two major events: the global social-environmental crisis (McRae et al., 2016) and the renaissance of the psychedelic movement (Millière et al., 2018). The latter is of equal importance but not very known yet, as it is only in its infancy. We are seeing great progress in our understanding of psychedelics and their role in our history, and our minds and bodies. Reputable and serious scientists, philosophers, journalists, and psychologists have spoken about the power and value of the so-called "plant medicines" or "entheogens" such as James Cooke, Fritjof Capra, Paul Stamets, Michael Pollan, Robin Carhart-Harris, Roland Griffiths or Rick Strassman. These compounds are being used to aid terminally ill patients with their fear of death, to treat addiction, to treat medication-resistant depression, and many other problems (Grob et al., 2011; Kaelen et al., 2018; Pollan, 2019; Millière et al., 2018). The classic psychedelics are substances that have been used for hundreds of years, and that have a very safe physiological profile, with the most risks being on the psychological front (Pollan, 2019). Rituals with entheogenic plants and fungi in our primordial stages are likely the origin of spirituality – and subsequently religion – and they could also have played an important role in the development of language, culture, and our expansion of consciousness (McKenna, 2004). With serious studies coming out confirming their healing potential, and a less fear-mongering mentality towards them, we are witnessing great results for healing the individual and whole communities (Cosimano,

2020; Grob et al., 2011; Pollan, 2019). They are not for everyone, and serious research about them must be done before experimenting with them, and they should be used preferably with professionals and/or shamans and in special retreats and spaces for the effect. These are powerful tools and can heal as much as they can harm. When used with respect, intention, proper research, and under the proper guidance, these experiences have the power to reconnect us to our inner divinity, sacredness, nature, each other, and much more; they have the power to heal, and we are in great need for such spiritual and mental healing.

It is important to explain that drug-induced mystical experiences are not "just hallucinations". They are not revealing any objective truth either. They are, in a way, the amplification of our mind and senses (Pollan, 2019), which can help us reach deeper understanding, to commune with the sacred, to contemplate, and to confront our demons and our Jungian shadow.

Although they do not reveal any truth, they can help people find their truth, their place in the universe, as certain recurring themes such as feeling the sense of self dissolve, feeling one with the universe, feeling energies, love, connection, and meaning remain very prominent in mystical reports (Cosimano, 2020; Pollan, 2019). They are the very experiences that bring about healing and spiritual fulfillment. And most importantly, they are not exclusive to the use of psychedelics nor do they necessarily contradict scientific consensus. The mystical experiences triggered by psychedelics are very similar to mystical experiences triggered by sober techniques, raising the question of whether they are "just hallucinations" (Fales, 1996). To Buddhists, these experiences aid the understanding of reality and our place in it (Capra, 1975). In truth, the mystical experience achieved by sober techniques is way more safe and stable, but because it requires dedication and daily practice it has led many people (westerners, skeptics, and scientists) to downplay and outright disbelieve their existence. Now we can reproduce these experiences on demand by administering entheogens to subjects. The evidence for their existence is indisputable now and we must study further the implications of this once-ridiculed dimension of the human being.

It is important to explain that a psychedelic is not classified as an entheogen just by its chemical structure. An entheogen is a substance that induces altered states of consciousness, used with the intention of exploring the meaning, spirituality, sacredness, "God", etc. The key requirement to be called an entheogen is not in the molecule, but in the way they are culturally seen, used for, and in the context of consumption. Using psychedelics like we treat a mere intoxicant, as recreation, leads to mundane and dangerous experiences, chaotic experiences and unexpected results for it lacks a ritualistic and ceremonial structure (Mackinnon, 2016). On the other hand, using them as sacraments, with respect and in a ceremonial setting, as well as by practicing integration of the experience is what makes them an entheogen, resulting in radically different experiences. This mechanism of intentionality is a new concept to the Western way of thinking, as we previously assumed that the physiological and psychological effects are the sole result of the chemical ingested; now, we see (especially with psychedelics) that intentionality, the environment, mindset, and many other factors have a much bigger impact on the effects than the actual

molecule has (Pollan, 2019; Millière et al., 2018).

When used with respect and proper setting, one can enter flow states where their mind becomes powerful and sharp allowing unimaginable breakthroughs and visions (Capra, 1975; Pollan, 2019). Scientists, psychologists, politicians, designers, artists, and many people from the many areas of human progress can use them to improve their field of wisdom tremendously rapidly, aiding at our short timed range of action regarding the planetary situation.

Again, entheogens are not for everyone, but they are safe for most people to use; they are helpful specifically to Westerners, who because of an overall skepticism, tight schedules, and busy lives, can not develop a deeper spiritual practice. For anyone who disbelieves the existence of – or wants to directly experience – these mystical states sober, Vipassana retreats are highly recommended, due to the reliable and vivid mystical experiences that the practice can induce (Shrader, 2008). The short-timed action and reliability of entheogens makes them valuable tools for people who have not had time to explore their spiritual side (but again, the proper study of the pharmacology, and psychology, as well as grounding, spiritual and shamanic techniques is extremely important and helps avoid misuse, helps navigate potentially difficult experiences and aids the process of integration). They also prove to be useful tools as we need a rather immediate planetary perspective shift regarding the spiritual dimension and interconnectedness of all life on earth, which would take a long time without the aid of entheogens.

This mystical dimension that is being explored here is the very sense of nature connectedness that this project seeks to kindle and that people feel when they experience a dissolution of their barriers, either by philosophical contemplation and also by direct sensorial experience. To truly reconnect humanity to nature (or to allow for a form of communication while keeping our ego and separateness), these experiences must be understood and explored. Individuals must explore the meditative states of ego dissolution to get an intuitive, pragmatic, firsthand idea of the implications of being one with everything. By creating an installation that points to, but also incorporates some of the aspects of non-dual states of awareness, it is expected that the value and beauty of these experiences can be conveyed and that more people can openly talk about their own experiences and the implications of these types of experiences on the story that we are collectively weaving every moment.

Einstein was likely the most famous mystic in the modern Western world, besides being the brilliant scientist and mathematician he was. A man who spoke of the illusory sense of separation and how it is affecting us negatively. In a letter to a Jewish rabbi, Einstein shares how human beings often see themselves as separate from the universe, creating a form of "prison" of personal desires. To escape this prison, individuals must expand their compassion for all living creatures and nature. True value as a human being is attained through liberation from the self, and a new way of thinking is required for humanity to survive (Sullivan, 1972).

The installation resulting from the process exposed in this document was titled "Symbolic Nature" as a reference to the biosemiotic analysis of biological

symbols and signs in nature, but also with the double meaning of describing the symbolic aspect or essence of something. The experience will attempt to invoke presence, calmness, and connection in the visitor and will help the sustainability movement, the humanist movement, and the spiritual empowerment of individuals and their communities.

To conclude, this project as a whole is a direct reference to the forgotten and misunderstood mystical dimension, a reference to the psychedelic. We are one, but the illusion of division is persistent. Let us awake to our connection – or better even, our lack of separation – to each other, nature, and the universe and heal. This is my intention: to remind us that we are more than our minds and bodies; that we are more powerful than we were led to believe; that we are more loved and important than we can ever imagine. In solitude, in fear, in despair and deep visceral pain even I forget, but the message is… the truth is: that everything is going to be alright…

2.2 Humanity and Nature

This section will introduce the two main themes of this project: Humans and Nature. It will mention evolutionary, psychological, social, and ecological facts. It will also outline the philosophical framework relating to the two and will attempt to demystify the mystical; to clarify anything spiritual or metaphysical being mentioned in this project. As humans, we are an extension of the cosmos, not something apart from it, and like the divisive concepts hurt human communities, so do divisive concepts hurt planetary ecosystems. The following sections pretend to highlight the commonalities while not ignoring the differences, for they are after all two different concepts.

One important thing that should be left clear is that — although the phrase "human connection with nature" will be used frequently throughout the document — it is suggested that one tries to look at the two not as things to be connected, but as things that already are connected, only that the connection is not clearly visible to some of us yet. For briefness and to avoid repetition, the verb was used to join the two concepts in order to explain some of the arguments. The reader is invited to keep in mind that every time they read something along those lines, the non-dual interpretation is intended to be taken into account. As Fletcher (2017) outlines, *"Asserting that we must "reconnect with nature", in other words, reinforces the impression of an entity from which we are fundamentally separate even in its advocacy of our overcoming this ostensible separation."* (p.4)

On a closing note, we can understand spirituality, in the context of this dissertation, as a spectral range of dimensions of consciousness where individual organisms can look at their interconnectedness within their holistic ecosystem and what that pragmatically means to the individual. We will properly define spirituality in time, but for now, let us understand that it can foster the commonly associated feelings of peace, presence, grounding, gratitude, and connection, but also feelings of warmth, melting, and subtle or even dissociation, which can be scary depending on intensity and context. Spirituality is, then, commonly associated with experiences of a progressive dissolution of the subjective sense of self, and the scientific evidence of such experiences supports the value and objectivity of certain spiritual systems. It can be said that humans and nature are, therefore, connected in spirit and that through spiritual — or other — practices we can witness that connection; or better yet, cease to see anything that could be connected.

Other means of uniting Humanity and Nature exist, such as through education and information, direct interaction with natural environments, exploration of emotional, and philosophical reasons for that connection, which are very useful and are not per se spiritual. However, this project seeks to incorporate those very approaches into a holistic rational spiritual framework. The spiritual is not, then, necessarily the metaphysical, as physical phenomena and events can sometimes be spiritual. What constitutes a spiritual phenomenon is — more accurately — the influence that the ideas and beliefs of a person about sacredness, divinity, transcendence, or death have on themselves.

Humans

The Human being is a bipedal mammal found on planet Earth. Humans are the most widespread primate in the whole world and are the most powerful species on the planet. We have their origin in the African continent, roughly 7 million years ago as the first hominids appear. In our beginnings our similarities with other primates were great. We had the same social structures, the same rituals, and the same habits. In the following years, the Homo Sapiens starts to emerge; We begin by stepping down from the trees, standing up, and walking into the unknown. The current consensus is that we mastered hunting very early on, and shortly after, fire. Early humans would focus on hunting together, collecting berries and fruits, and crafting rudimentary tools such as spears and hammers. We began to create structured societies of roughly 10-30 individuals that gave roles to different individuals. Our interactions with other groups also allowed for the exchange of foods leading to better nutrition, and with them, the technological discoveries spread into a quickly growing network of nomadic self-aware apes (Harari, 2018).

McKenna (2004) makes the case that ancient hominids have found and began regularly using the very common Psilocybe Cubensis mushroom, which was a catalyst for the development of language, art, and abstract thinking, which was crucial in our first steps as a civilization. The psychoactive plants humans first discovered have likely played a role in the abstraction and consolidation of our human habits and beliefs. This phase of evolution, alongside cooked food, led human brains to grow in size, and it likely carved our primordial sense of pattern-seeking, self-awareness, language, community, cooperation, spirituality, rituals, and art among many other primordial principles (McKenna, 2004). We begin burying the dead and create rituals for the seasons and astrological bodies. The human being then mastered tool making, and fire, and then became farmers and shepherds. Our tribes remained small throughout this phase. As we reach the Iron Age, humans become more sophisticated and our communities grow in size (Harari, 2018). Since then, we have been always expanding and progressing, often at the cost of forced labor and wars.

And then, in the 1700s, something profoundly impactful happened: the industrial revolution (Harari, 2018). Our evolutionary path, our ideals, and our ways of being would never be the same again. With more power than ever imagined, and little responsibility or wisdom, we thought the technological advancements were all good. The thirst for constant progress and competition with other corporations and governments has led us to synthesize forever chemicals, contaminating land with pesticides that harm the ecosystem and us, led to the global endorsement of plastic, and has led to the quest for the best and most destructive weapons. A reflection of the collective shadow and capacity for evil in each of us.

Since the Industrial Revolution, not long ago (evolutionarily speaking), we have witnessed the most radical changes in our societies, many of which have started (or will start in certain cases) to have dire consequences on our overall health. For example, our processed diets and their damage to our bodies (Askarova et al., 2020; Choct, 2009); our screens and their impact on sleep (Hale & Guan, 2015) and social skills; or the microplastics that have found themselves into the bodies of almost

all humans on the planet (Prata, 2018; Wright & Kelly, 2017). Our current system requires constant economic growth to work, and that is simply impossible in a world with limited resources (Capra, 2007). We are raised and culturally educated to consume (Harari, 2018), and right now we need to stop this insane suicidal act of buying plastic and food that is treated with harmful pesticides and herbicides. Permaculture and food forests could help with this issue (Albrecht & Wiek, 2021; Krebs & Bach, 2018), more on that under the sustainability sub-section of the Conceptual Basis.

With scientific advances, religious institutions have been gradually losing their merit, and humans have been moving away from organized religion. This is not only expected but healthy. We are beginning to question why these rules, and while many are old fashioned, religion has played its role in human development; we are taking the next steps towards new ways of being now.

Given that this dissertation and the installation it will create are related to the mystical, spiritual and sacred, it must be clarified how these dimensions of being are present in not just some people but everyone. Let us begin by defining spirituality. Spirituality can mean different things depending on the contextual area of knowledge. In nursing and medical fields, Colleen Delaney (2005) defined spirituality as a multidimensional phenomenon that is universally experienced, in part socially constructed, and individually developed throughout the lifespan. Spirituality, according to Delaney, encompasses a personal, interpersonal, and transpersonal context that is composed of the four domains:

(a) higher power or universal intelligence—a belief in a higher power or universal intelligence that may or may not include formal religious practices;
(b) self-discovery—the spiritual journey begins with inner reflection and a search for meaning and purpose. This process of self-discovery leads to growth, healing, and transformation;
(c) relationships—an integral connection to others based on a deep respect and reverence for life and is known and experienced within relationships;
(d) eco-awareness—an integral connection to nature based on a deep respect and reverence for the environment and a belief that the Earth is sacred. Eco-awareness is rooted in deep ecology and the Gaia hypothesis

Spirituality in other contexts such as quantum biology and quantum physics points to a form of nonlocal connected consciousness that has a physical-scientific foundation which indicates how some mystical or spiritual direct experiences of a collective Oneness have a valid basis within the most recent scientific paradigm (Alan Wolf, 2005; Dennis, 2010).

Spirituality, as said in the artistic statement of this document, is an umbrella term that includes that which is beyond the physical. It refers to the experiences of things that are not material, which all humans experience: love, hate, grief, ecstasy, bliss, sacredness, etc. The metaphysical is a concept often misunderstood. To say that, for example, emotions or thoughts are metaphysical is not a false statement. They are mappable to neurophysiological mechanisms but are not solely their materialistic expression. Holism would remind us to join the two apparently opposing perspectives into one coherent perspective or model.

Mysticism is also a term that should be cleared up. The Stanford Encyclopedia of Philosophy defines mystical experiences as *"a (purportedly) super sense-perceptual or sub sense-perceptual experience granting acquaintance of realities or states of affairs that are of a kind not accessible by way of sense perception, somatosensory modalities, or standard introspection"*. Such experiences can be characterized by a temporary loss of the usual sense of space, time, and feelings of sacredness and unity with the cosmos (Cosimano, 2020). Recent controlled studies have also shown mystical experiences are associated with lasting positive results in participants (Millière et al., 2018).

To cover a bit of human psychology and physiology, one must take into account the fact that N, N-dimethyltryptamine (DMT) is produced endogenously in the human body (Dean et al., 2019). The function is yet unknown, but the fact that one of the most potent psychedelics known happens to be a natural neurotransmitter and that it is also found in many other plants and animals is remarkable. This means that our baseline consciousness is already slightly psychedelic by itself. This could also be related to the phenomenon of sober mystical experiences, which can be very intense, and could explain the similarities reported between sober mystical experiences and entheogen-induced ones (Fales, 1996; Millière et al., 2018).

Regarding the human psyche and an example of the overuse of materialist reductionism let us take for instance, how the mapping of the brain is done, and how such rigid categorizations have left scientists and psychologists sometimes confused when trying to make predictions or apply that knowledge. *"[...] as if they're Lego blocks, as if there are firm boundaries there."*, says Lisa Feldman Barrett, psychologist at Northeastern University (Cepelewicz, 2021). For now, it is useful to keep applying the concept of human to human beings, but we have much to learn from a less egoic worldview and temporary states of non-dual awareness (Millière et al., 2018).

Another aspect that forms our human mind is the Ego. The Ego can have different understandings, depending on the scientific area of context. In Jung's psychology, it refers to an element of the psyche concerning a subjective experience of self-identity, in contrast with the outer world and that coordinates conscious mental processes like memory and cognition. It serves to keep our sense of identity and cognition cohesive (Jung's Model of the Psyche, n.d.). The ego gives us individuality and through individuality, we get diversity; diversity of ideas, cultures, ways to think, ways to speak, to express ourselves. It is a valuable tool of evolutionary biology.

But it also makes us avoid changing and is usually the culprit behind closed minds. In Figure 1 (Ego vs Eco) we can see a contrasting stance on humans and nature clearly summarized. We should embrace our differences and our peculiarities, as well as our individual ways of being and cultures but also work for a bigger whole that is us, Humanity, and the planet Earth.

The so-called mystical experiences of ego dissolution that are going to be heavily mentioned throughout this document are beginning to be understood under the context of neuro-biology as a reduction of the activity of the Default Mode Network

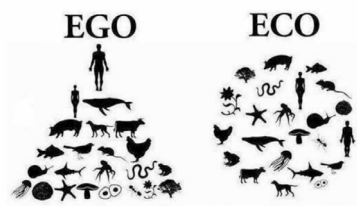**Figure 1** Ego vs Eco perspectives
(from: ec.europa.eu/energy/sites/default/files/documents/1._ruth_reichstein_dg_eac.pdf)

(DMN) of the human brain. This network is associated with mind wandering, however, when activity reduces, individuals report a sense of ego reduction and a feeling of physical, intellectual, and emotional merging with the surroundings (Carhart-Harris & Friston, 2010; Michael Pollan, 2019; Millière et al., 2018).

The human psyche is – to a large extent – impacted by our spiritual life even if we do not describe it as spiritual. Things like contemplation, honest expressions of gratitude, practicing solidarity, or meditating are, in a way, spiritual. When talking about the ego as the experience of self in contrast with the rest of the world, we can see that that experience – at a cognitive level – rarely takes into account what goes beyond our body. The air, for example, can be seen as an extension of our respiratory system which connects with the plant's photosynthesis process (which in essence is a mirror of the cellular processes that happen in our lungs). This results in us establishing firm boundaries that are arbitrary in essence. The lungs, the air, and the photosynthesizers are all one organ working together.

So, the ego gives us that sense of self, our ideas and morals. What about more objectively, are we actually individuals? The limits of the human body are usually defined by the boundaries of our skin, but we are also in constant exchange with the outside world: we ingest food which breaks down the matter so it can be used by our bodies to organize our cells and structure our organs, we expel the remaining unusable matter into the world and it is used by other organisms, we breathe in oxygen, which is the biological mirror of the what plants do, we interact with the outside world and manipulate matter easily. We manipulate the physical world and the metaphysical as well, through language, philosophy, and science.

We are a fundamental part of something great, not directly but in a layered fashion. We are, first of all, an inorganic group of elements that make up cells; cells that organize organs that organize systems that compose our body; which then compose us as humans; beyond that, we start having difficulty in identifying ourselves with the rest of reality. We may feel the sense of being part of something more abstract, like a family, a tribe, or a community (For example, our family well-being directly impacts ours, suggesting that in some contexts, we actually "blend" into our community, such as the phenomenon of cultural homogeneity). After that, we may feel part of a country, a nation, or humanity itself. And the next step would be feeling part of all living things and eventually nonliving as well, ending in a feeling of belonging with the whole universe. But those last ones are understandably harder to relate to, especially in our limited Western culture. The feeling of awe and recognition of the sublime essence of life and the universe is one that is in line with the pantheistic worldview and animistic indigenous traditions, and it is possible that these worldviews may help us in our current collective state.

In conclusion, yes, we are individuals, but there is great value in stepping out of that hard categorization and seeing how we may actually be more than individuals or, in other words, how the boundaries are not as fixed as we might initially think.

Nature

So, our individual attitude composes our humanity, which then composes the planet. How can we improve coherence and establish global well-being? Well, first we must ask ourselves what is nature? According to the Oxford Learner's dictionary, nature can be defined as the physical world composed of animals, plants, mountains, oceans, stars, etc.. that are not created by humans (Nature, n.d.). This is a useful definition, and it does have an important role to play when we need to talk about our actions as humans and how ecosystems and individuals are before and after our intervention. However, this definition can be a dangerous one. One that morally sets us apart from nature and allows for the exploitation of its beings and resources (Mathews, 2011). When we place ourselves as something different from nature, it seems to me that we will have an easier time following an ego-driven mentality, where we believe our creations and ourselves to have a somewhat special status. And even if we do not attribute special status to ourselves or our creations, it limits us philosophically and encourages a divisive perspective. It is not implied here that dividing and categorizing is bad, but that we have been overly using that approach.

"If humanity is to be resituated inside nature, in the interests of bringing humans and nonhumans into the same moral camp, then this must be achieved without reducing the human to the terms of the dualistically defined natural. In other words, it must be achieved in a way which opens up the terms of the natural, so that they can become inclusive of the artefactual." (Mathews, 2011, p. 366)

This is exactly the mindset that Gaia's Theory builds, or the Eastern non-dual philosophy, now being linked with many Western scientific fronts such as quantum physics and phenomenology. Our evolutionary perspective has once been at the level of cells, which would mean a rudimentary form of perception that then created organs and entities, much in the same way we now begin to shift from being human-cells to being societal-organs and then a Gaian planetary-entity.

Why is a spider's web, an ant hill, or a beehive considered nature but a bonfire or our houses are not? Many living organisms manipulate matter just like us, but we do not consider their creations artificial. If we try to at least look at ourselves and our creations as natural, we may improve our connectedness and respect for the whole planetary ecosystem. This is because we dissolve a self-imposed mental barrier, which although psychological in nature, results in the conceptualizations pushed forward and the very shaping of the world around us, our communities, and ecosystems. This can be helpful for example in conservational efforts (Fletcher, 2017), but as a constant collective attitude, it poses long-term risks.

It seems like having respect for nature is hard for some. If we exclude the question of animal rights, the rest of nature is simply nonreactive. Plants

and rivers do not have a nervous system; they are incapable of suffering. This may be the reason why people in general do not feel an immediate concern for the state of the planet. The system however depends on a balance, a homeostasis that allows the temperatures to be average, the mineral cycles to replenish, the forests to regenerate, and the rivers to clear.

Humans are not in harmony with nature for we do not respect the rhythms and cycles of the planet (McRae et al., 2016). We synthesize chemicals and materials that are not found in nature and that can have serious side effects. This is one great example of the usefulness of drawing a border between artificial and natural. The most notable material with devastating effects is plastic, which seemed like a cheap, practical solution to many of our problems until we found out that it does not decompose, and right now, microplastics are being ingested and inhaled by basically all humans, posing serious health issues (Prata, 2018; Wright & Kelly, 2017). We just do not know what our next technology might do to ourselves, our social fabric, or the whole planet. Some examples of particularly risky tech are A.I. (Makridakis, 2017) and genetic engineering (Chargaff, 1976).

Perhaps humanity has never actually been in harmony with nature. In a way, we have been brutalized by it, suffering famine, disease, natural catastrophes, and more. But since the Industrial Revolution, we have switched roles completely, and we are the ones that brutalize nature now. Right now we are the ones brutalizing nature, almost as if avenging what has been done to us, or like we fear losing even the slightest comfort that we have achieved. Therefore harmony should translate into a less rushed technological and economical development, focusing less on metrics and statistics of growth, and more on being present, to feel, to take in the beauty all around us, to contemplate, and being more comfortable with what we have and our limitations. To stop for a bit, or at the very least, to slow down.

To be in harmony with nature is to know where to be active or passive, when we have to act or just observe. We tend to overthink and overact. Harmony with nature is being aware of the rhythms of the seasons, the plants, and animals and to act in synergy with those fluxes. Using the solutions nature offers, for the millions of years of evolution have generated quite sophisticated and efficient biological "technology" that we can inspire ourselves in or even use directly. This is the principle of biomimicry, which looks at nature as a source of practical and aesthetic inspiration. Being in harmony with nature could mean engaging in good faith in an environment where we coexist with other life forms, and wishing for their prosperity and success (whatever success means from a biological standpoint).

We are in harmony with nature when we want to protect an ancient tree or a population of endangered foxes; when we want living species to evolve, just as we want ours to evolve, not giving us a special status, for all living beings are all in the same boat, ourselves included. And for readers that already understand that the concept of nature does not have to be limited to the concept of plants and animals in a raw state, they can also notice how an urban space can be nature, being able to be in harmony with the city and

its flow of events and ways of being. Or a family home, and how to desire the success of those forms of life we call spouse and children, is to be in harmony with that expression of nature, to also be in harmony with them (not in the sense that there isn't confrontation and discussions in the nuclear family, but that all the members are really heard and understood, that they forgive and are forgiven, can be honest, can grow and learn together, overall creating a positive reinforcement feedback loop where humans feel supported and loved, with transparency, honesty, and open-heartedness). Or even harmony with our own human nature, as individuals (usually achieved in what some call meditation), and trying to understand ourselves beyond excuses, denials, fears, and human ego games. It is therefore important that we look for that harmony and balance with nature, and especially ourselves as individuals.

It can be said that the human being of the current century is simultaneously more connected and disconnected. There are indeed ways to contact a human being almost anywhere in the world immediately. But at the same time, we are disconnected from each other. Social networks aggravate a problem of emotional distance, toxicity, and superficiality. We give a lot of importance to what separates us from others (race, gender, sexual orientation, religion, political affiliation, clubism, ideology) and little to what unites us (or we believe that union over those things is good, while we should be looking for things that unite us more broadly than human-made categories, like being human or a living creature). The connection with nature itself is also scarce, especially in cities, and less trees, more noises, and dangerous chemicals make the environment stressful, and we know now that stress does have a serious impact on physical health.

To conclude, we must look after nature and the older natural processes. We, as the supposedly most intelligent and powerful beings on this planet, have to keep the balance of the global ecosystem at all costs. We must be careful with transhumanistic ideas and developments, as they may lead us into a new branch of problems and suffering; Interfacing the minds with computers is an obvious idea that has potential dangers and is a way for techno-totalitarianism, or genetic editing and engineering which can also lead to enslavement, classicism, and more totalitarianism. We must then, while not giving up totally on science and technology, return to a more primal sense of self, in order to slow down our human vision from the future into the present. Older and endogenous technology will prove to be more useful than we once thought, allowing us access to certain commodities and comforts while slowing down the use of newer technology. We will find much healing when we start to commune with nature on a more sacred level as a collective.

2.3 Potentially interested parties

The installation and the experience it potentiates are targeted at the general public. It seeks to be broad, holistic, and accessible, regardless of culture, language, or education level. It will not teach more than a simple meditative exercise which people are getting more comfortable with, given the scientific backing. It will attempt to cover the basics for the visitor in a clear and simple way. Biophilic people will also greatly enjoy the overall theme and setting created by the installation. The deeper message seeks to reach the spiritual and scientific communities, and appeal for a dialogue and systematic reconciliation of the two disciplines in order to improve scientific and spiritual knowledge and wisdom.

Politically, the message is also a statement for the progressive, careful, deliberate reduction in authoritarian force, and more on positive reinforcement and education. It seeks to also point to our inseparability, and politically that means practices and measures that are holistic, and with nature and sustainability at a core.

In terms of the resulting artifact, and not just the message, different groups, institutions and organizations may find this project useful. Scientists and Educators, especially ones focused more on neo-humanist, transpersonal, mindfulness values and practices may find this project helps them teach children and youth about the principles outlined, or in a search for new ways of doing science. At the time being, there has already been an instance of a cultural organization from Sintra, called Éter, interested in the installation and its potential, which confirms the real-world value and applications of this project. The world of festivals, namely psychedelic festivals such as Boom, ZNA, and Forest Soul Gathering in Portugal or Burning Man in the USA is also a big player that not only aligns with the project's concept but also employs the same type of installations during the festival, which means that registering "Symbolic Nature" as a media project for a future event and being selected is a possibility.

Finally, remaining interested parties include those who are into deep ecology, environmental art, fractals, sacred geometry, neohumanism, universalism, pantheism, technogaianism, biosemiotics, shamanism, mysticism, and psychedelism, and all of those who can see a thread connecting all of these topics.

2.4 Proposal outline

The proposed project includes research in the fields of human psychology, human history, environment and ecosystems, mysticism, holistic thinking, fractal thinking, patterns, morphology, symbology, biomimicry, and semiotics. In addition, the research covered more technical domains, such as mixed realities, interaction design, installation design, sound design, and visual effects. As previously mentioned, the proposal being presented here is regarding an experience potentiated by an immersive interactive installation, which pretends to bring presence, awareness, and understanding to humans; it pretends to raise certain questions about the illusory concept of separation. For this, the proposal is to develop a planification for the installation, develop the artifacts, to evaluate how visitors react and interpret the installation, and to document the process and findings. Given that it is an artistic installation, the key value is emotional impact and not information transfer and this was kept in mind throughout the development of the project.

The topics that inspired the project – which will all be covered ahead – were mainly holism and the Gaia hypothesis for its provocative but harmonious and unifying stance; Biomimicry, as it reminds us to be humble and learn with nature as well as to use organic designs for they induce feelings of biophilia as we use our spaces and objects; Biosemiotics for their goal to bridge biology, philosophy linguistics and communication sciences by studying the representations, meaning and significance of codes and signs in not just human constructs but also the natural world; Mystical experiences and their value in teaching the egoic mind that we are more connected than we can even imagine.

Biomimicry and biosemiotics shaped the visual language and conceptual patterns outlined, and also added symbolic weight to them. The very idea of pattern and fractal thinking that is explored in this document stems from the concept of biosemiotics and how shapes, patterns, and geometries can carry more importance than meets the eye. The attempt was to convey the fractal structure of reality through biosemiotics, like a language halfway between human language and natural language. This is linked also to the idea of biophilia and how these patterns can actually induce states of well-being in those who see them (Wilson, 1984). The harmonious patterns are repeated at different scales in a fractal fashion.

So with that in mind, we propose to use these morphological patterns to communicate the idea of non-separation due to the sharing of archetypal structures and designs across different organisms and biological phenomena. Non-Dual Awareness (NDA) is, in a way, the thing being communicated with the visuals, but also one experience which can help understand the meaning of the signs. More on this later. In fact, the entoptic phenomenon is usually experienced in such NDA or mystical experiences, and such phenomena can include spirals, honeycombs, tunnels, fractals, full-blown 3D environments, and even impossible geometry (Luke, 2010).

"The visual appeal of nature has a strong influence on becoming connected to nature as beautiful or dramatic nature is novel enough to catch the eye of otherwise oblivious individuals. This relates to the finding that actively noticing nature led to an increased connectedness with nature with the sensations, growth, beauty, and wonder being key themes" (Lumber et al., 2018, p.11)

In essence, the experience and all of the conceptual basis on which it rests upon can be described as eclectic. The goal is to unite different perspectives (mainly the scientific one with the spiritual one) and show how they overlap in some aspects (Dennis, 2010; Fritjof Capra, 1975; Walach & Reich, 2005), or also eclectic in the sense of bringing together humanity and nature to create something that bridges the two. For that, visual and also conceptual patterns in the world around us were used in the experience in order to show how beautiful and intricate existence can be and to reinforce this bridge between what has been found by the scientific method and what has been found by the more intuitive and wise minds of human history. Different systems, different perspectives, different cultures, and yet similar truths, similar goals, similar symbols, and similar results. When we begin overlapping the scientific with the cultural and spiritual knowledge, we can better validate them by the means of pattern finding. The experience seeks to unite humans through those patterns mostly. In the end, it is trying to portray that which is beyond words and beyond the rational mind. There is nothing to be grasped; what is needed is a relaxation from that need to grasp and just be.

The diagram shown in Figure 2 (Ives et al., 2018) proposes a hierarchical weight for each domain of a given nature interaction. It postulates that the "inner" connections have a higher facility at bringing about systemic change. Interactions that are based on such "inner" connections, like philosophical perspectives or emotional responses to nature, are more abstract and therefore harder to convey but have more weight and potential for change. This document and the project as a whole seeks to follow the prioritization established in the diagram.
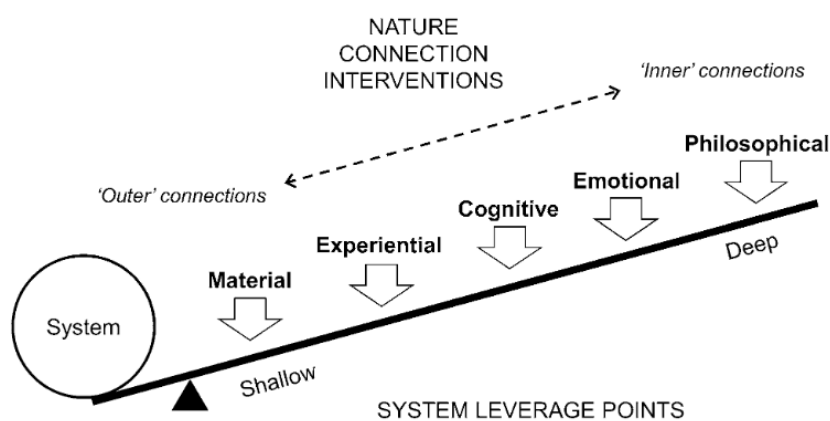

Figure 2 Nature connection interventions leverage points (Ives et al., 2018)

At the end of the experience, the visitor is expected to have some questions but also epiphanies. It is hoped that this will lead to further individual research on the novel scientific knowledge but also of the more spiritual one. The visitors may

also engage in informal dialogue about some of the topics and this may lead to an opening and vulnerability, creating a greater connection with the other. This emotional connection with the other human is a key point, as we can only change the course of humanity by speaking and trying to understand even those who seem less moral or less humane than us. Interestingly, this has similarities to a practice of Buddhist philosophy called Mettā, which consists in the expression of benevolence, friendship, compassion, etc. for others, starting with our loved ones, then our friends, then strangers, and finally – and also more difficult but with greater benefits for all humanity – for those we dislike or consider to be our enemies.

The practice of meditation itself is something that indirectly seeks to be encouraged, as the goal is basically to slow down humanity and change the focus towards a more contemplative, peaceful state, characterized by the presence at the moment and detachment from material goods. If there is a possibility that we are collectively overly focused on economic growth, consumption, and sensory stimuli, then to change that we have to do it from the bottom up, that is, at the individual level.

"Besides individual well-being, one potential outcome of meditative practice is an increase in empathy and compassion, which are regarded as antecedents of prosocial behavior. [...] suggested that meditation can support a shift from self-centered to selfless functioning, characterized by "a weak distinction between self and others, and self and the environment as a whole," which in turn "is closely related to characteristics such as altruism, kindness, respect, empathy, compassion and the search for harmony" (Millière et al., 2018, p. 20)

This very document is a part of the proposal, and it seeks to clarify why this topic, why these approaches and how they function and how they came to be developed. The proposal is not simply the installation; it is the transition design; It is a proposal for a new method of delivering messages of environmental awareness. The language barrier between humans and nature is a hurdle we must cross, and this project was developed as if nature is speaking through it for humans to understand or as if humanity spoke through it so nature could understand taking inspiration from biosemiotics and biomimicry, as well as symbology and sacred geometry.

The installation is composed of visual, audio, and tactile elements, which create an immersive sensorial environment that leads the visitor through a potentially transformative experience. The production process will follow a double diamond methodology and starts with a conceptual and technical study of different topics such as environmentalism, sustainability, ecology, psychology, sociology, physiology, history, mysticism, etc. The goal at this point is to define key themes and to explore opportunities to be used. The installation proposed here seeks to be a flexible and modular system that adapts to the space it is installed on. A set of guidelines is going to be laid down for a rigorous and accurate replication of the experience, while maximizing the value extracted from the particularities of the space chosen.

3. State of the Art

The state of the art chapter serves to analyze relevant knowledge relating to the concept of the project. As such, it contains a section titled *Related works*, containing projects such as new paintings, videos, music albums, or media installations. The goal is to understand the main strengths and weaknesses of previous projects of similar nature and to analyze the state of technology in regards to performing new media installations relating to nature themes.

Another section titled *Natural structures and designs*, documents and analyzes different natural patterns and structures, which seeks to categorize the main biosemiotic signs of natural formations, how they emerge and what possible philosophical interpretations can be taken from these structures. The section serves as a general showcase of what patterns humans have found and understood in depth.

Last but not least the state of the art relating to the auditory domain is shown, where we will cover the main value of music and sound regarding nature connection and spiritual practices and how that has inspired this project.

3.1 Related works

In this section, we will be analyzing multimedia works, which will influence the visual style and provide a strong visual-conceptual bridge to the project, for the projects that will be shown are not just visually connected to the project at hand, but also conceptually. Nonetheless, the media support was an important quality when choosing what works to include, and it focused more on the multimedia and video domain. The projects offer valuable aesthetics and concepts, serving almost as the intermediary between the Natural Patterns and Conceptual Basis sections of the dissertation.

Let us begin with still images, such as drawings and paintings. The book "Art Forms in Nature" (Haeckel, 2012) is a relevant, detailed piece of art. The drawings are of great quality and the page compositions are thought through and balanced. In the book, various living organisms can be seen,
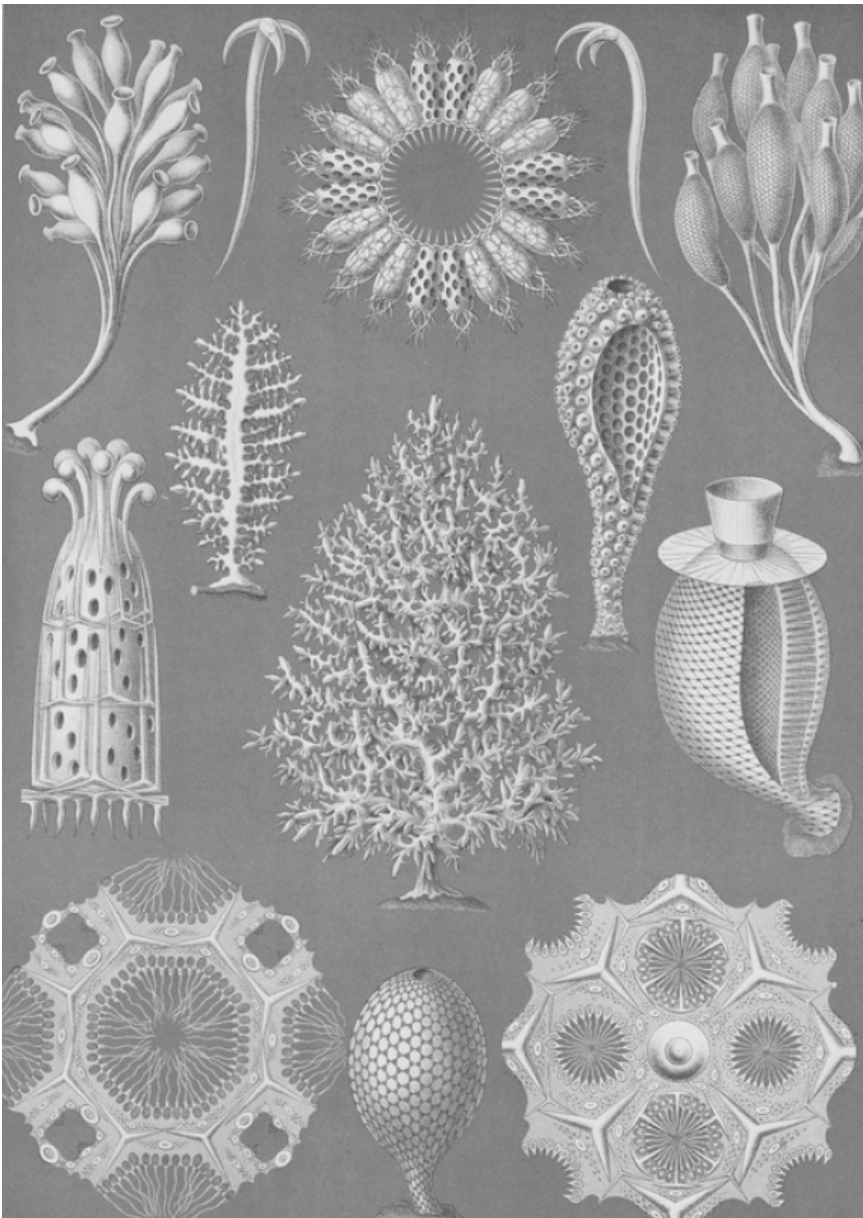
Figure 3 Calcareous sponges exhibiting branching and hexagonal patterns (Haeckel, 2012)

some of which look alien. It just so happens that they are all organisms from our planet. From microorganisms, radiolaria, fungi, jellyfish, insects, and animals, the compendium is very diverse while keeping a certain aura of harmony, balance, and a good highlight of natural patterns and structures. (Figure 3) Most of the patterns will be covered in the next section, but what the work of Haeckel gives to this project is the documentation of the different ways that these patterns interact, combine and emerge out of, and with each other.

The work of Karl Sims in the field of computer graphics and animations overlaps the still image, video, art, and science to create unique works. Karl has published various papers on methods and techniques around computer graphics, more focused on evolutionary and particle simulations (Sims,

Figure 4 Reaction-diffusion walls
(from: karlsims.com/rd-mos-3.jpg)
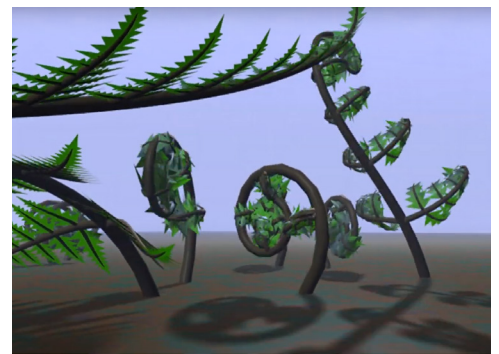
Figure 5 Fractal ferns in the animation "Panspermia"
(from: youtube.com/watch?v=Vxg8qgXVHLU)

1990, 1994). His artistic work consists mainly of animations (Figure 5) and interactive exhibits centered around natural themes (Figure 4). His technical and mathematical explanations offer great value to the project, as they inspire both artistically and technically the biophilic designer. The work by Karl is pioneering and encourages future artists and scientists to carve the road of biosemiotics and biomimetic design.

Similarly to Karl Sims, the Etérea Studios, created by the Spanish artist Cristóbal Vila has created a short video titled "Nature by numbers".

Figure 6 Voronoi on a dragonfly
(from: vimeo.com/9953368)

The short animated movie by Etérea Studios shows mathematical and geometrical patterns across different natural systems (see Figure 6 and 7). It can offer a different perspective on the universal constants that bind us to the rest of the universe. The patterns and geometrical structures are
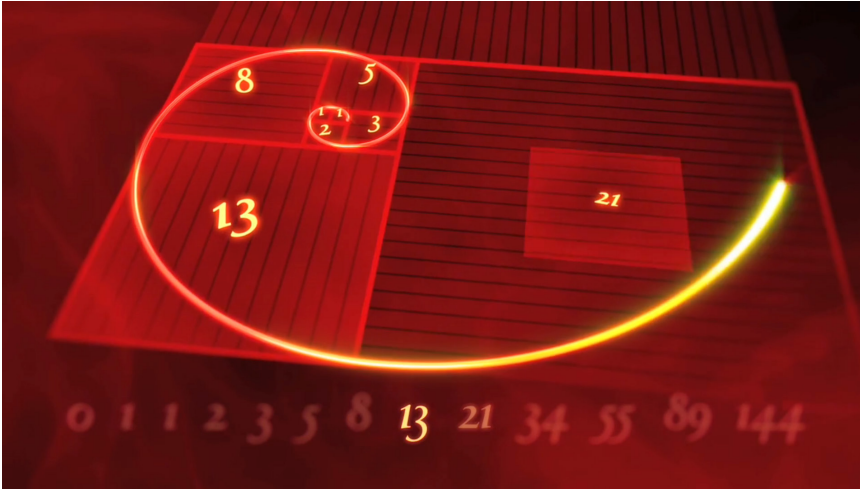
Figure 7 Golden spiral and the Fibonacci sequence
(from: vimeo.com/9953368)

animated in great detail and with great skill when it comes to transitions, which helps sell the concept of transversality and cohesiveness of these patterns. Conceptually, the works of Cristóbal Vila are very in line with the concept of this project, and the contents as well as the methods serve as inspiration for the video aspect of the immersive experience, by trying to convey the patterns in a didactic way.

Before delving into the world of new media art and immersive installations let us cover a musical project. Max Cooper is a British electronic music

Figure 8 Simulated entities by Maxime Causeret
(from: youtube.com/watch?v=_7wKjTf_RlI)

Figure 9 Album cover using generative processes
(from: emergence.maxcooper.net/src/gfx/share.jpg)

producer. His works go beyond the music itself and the producer is always looking to add an artistic and conceptual and philosophical dimension to his albums. Max Cooper holds a Ph.D. in Computational Biology and his musical and artistic work reflects that interest. A great example strongly linked to this work is the album "Emergence". The concept album focuses on natural

laws and processes and their beauty. The project tells a story that follows the timeline of the universe, starting with the big bang and moving on to the first physical and chemical processes, abiogenesis, emergence, complex life, self-awareness, and altruism among other themes. The project had the collaboration of visual artists and mathematicians for each video, like in Figure 8. The actual music of the album is textured and rhythmic, with precise and melodic chords of various synthesizers. The atmospheric and organic qualities of the album are an inspiration to the project at hand, as the experience seeks to invoke certain emotional responses using beautiful harmonies but also to keep the environment of the experience very nature-oriented, by using subtle organic sounds of water, trees, or birds. The designers of the visuals for the project "Emergence" have achieved refined and complex visuals relating to a myriad of phenomena, which served as a great source of inspiration (Figure 9).

Let us go now into new media and immersive installations. The first work to mention is by Philipp Frank. The visual artist has mastered the dimensionality of video projection and achieved environments of great

Figure 10 Usage of trees as projection canvas
(from: philipp-frank.com/wp-content/uploads/2020/04/Message_from_the_Forest_
Philipp_Frank_00.jpg)
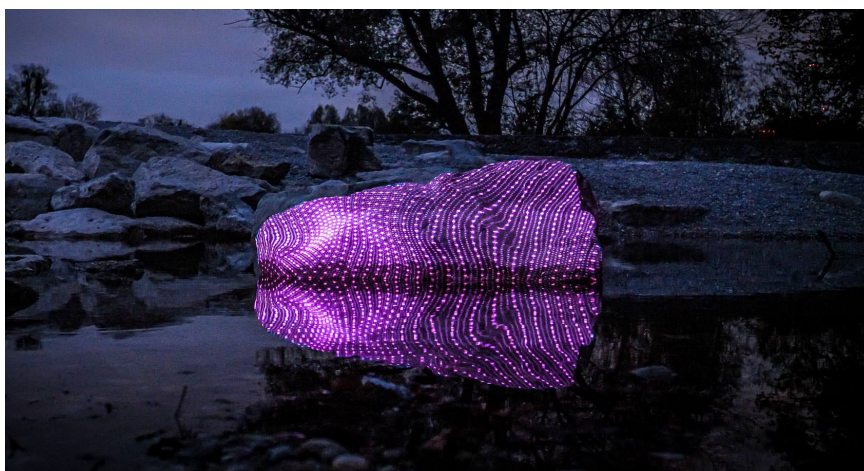
Figure 11 Usage of rock as projection canvas
(from: philipp-frank.com/wp-content/uploads/2020/01/Elements_projection-mapping-01.jpg)

contrast of depth and textures by using natural elements such as rocks and trees as the projection canvas as shown in Figure 10 and 11. His work is very nature-based, be it by the techniques as well as the message conveyed. The projections themselves are geometrical and harmonious, but the experience being developed will abstain from kaleidoscopic and hyper-symmetrical visuals.

Figure 13 Projections for the installation "Data.path"
(from: flickr.com/photos/rh2ox/9990024683/in/
photostream/)
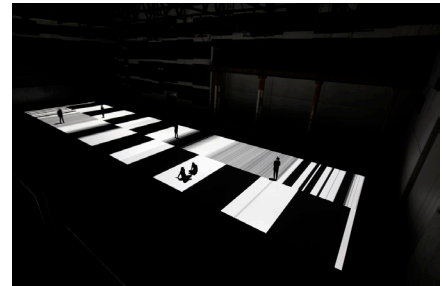
Figure 12 Projections on the ground
(from: upload.wikimedia.org/wikipedia/commons/f/ff/
Ryoji_Ikeda.jpg)

Another artist of new media art is Ryoji Ikeda. The work by the Japanese composer and visual artist is textured and dynamic, which was an important reference for the installation being done. Ikeda's projects are mostly immersive environments bathed by projections and sound (see Figure 12). The data giving order to the visuals and the soundbits is open source or sourced from NASA or CERN. Ryoji likes to explore the mathematical aspect of his work, by delving deep into the core of the theoretics with Benedict Gross, an assistant and also Harvard professor. The works by Ikeda were highly influential for the project, mostly visually. The black and white compositions are cleaner and less overwhelming to observe, and this directly influenced the visual language of the project to develop the visuals in black and white, as shown in Figure 13. Color was added through channel splitting, but the effect is subtle, appearing black and white from even a close distance.

Angelica Mesiti is another artist that has produced a specific installation relevant to this dissertation named "Over The Air and Underground". Angelica's installation consists of the exhibition, on several screens, of flowers where mycelium can be seen growing on them (Figure 14 and 15). The installation concept has to do with the connections that plants and trees establish with each other in order to communicate and exchange nutrients with each other. These connections are only possible due to the presence of the mycorrhizal mycelium between them, which acts as the means of communication itself. The flowers shown were filmed with an ultraviolet camera. It turns out that flowers have patterns in other bands of the light spectrum because bees can see, and these UV patterns draw pollinators into the center of the flower. The installation sound consists of vocal harmonies that play in harmony with the 220 Hz frequency, which is roughly the
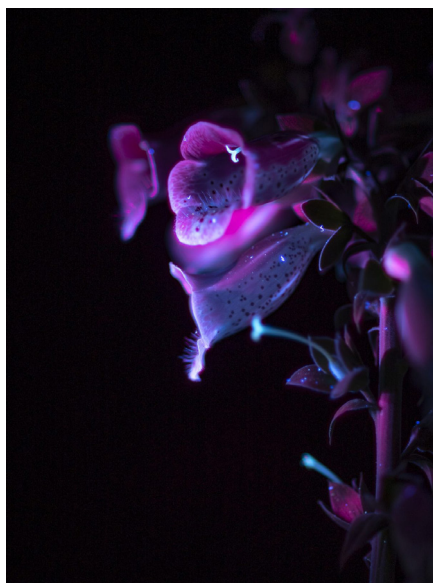
Figure 14 Details of the installation
(from: annaschwartzgallery.com/asset/library/_large/
MESITI_Over-the-Air_2020_DSC04022.jpg)
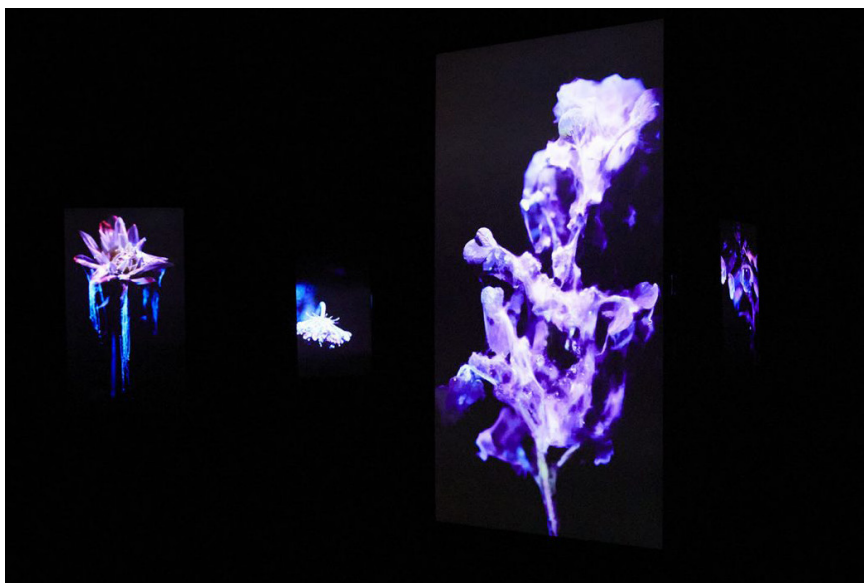
Figure 15 Dark and immersive environment with details of the projections
(from: annaschwartzgallery.com/asset/library/_large/MESITI_Over-the-Air-and-
Underground-2020-5.jpg)

frequency that the roots emit and seem to grow in the direction of the sound
played at this frequency.

Last but not least is one of the closest works, both in terms of aesthetics,
concepts, and support: the installation "Digitized Nature" by the TeamLab
team. This installation is an immersive experience that makes use of
video projection to create aesthetically pleasing environments where
nature is the theme. Conceptually, the team says that the technology of
sensors, networks, light, and sound does not have a negative impact on
the environment (if we exclude the manufacturing process and the non-
decomposition of some materials), and therefore it is possible to create
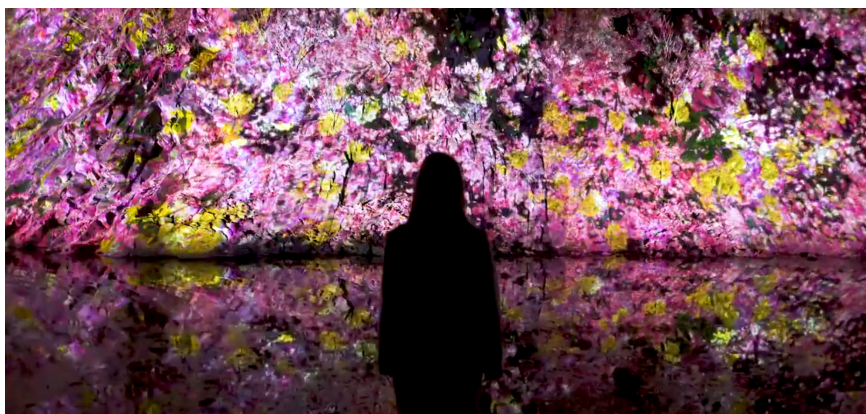
Figure 16 Frame from a promotional video of Digitized Nature
(from: twitter.com/teamLab_net/status/1228207644457857024)

an experience where nature becomes in living art without having to be
damaged (Figure 16). The experience has an interactive component, and the
presence of visitors affects the behavior of the installation.

This project seeks to offer a perspective of the natural world that is larger

than human understanding. We have been evolving for a very long time. We started roughly 3 billion years ago but the scale is so large that we often miss how long the process is in its true dimension. In this project, the TeamLab team tries to put that long time in perspective for us to grasp how important it is that we respect the evolutionary process deeply.

"Nature's shapes and textures as well as the changes wrought over time represent overwhelming information beyond what humans can comprehend. By incorporating such elements, teamLab believes that artworks have the potential to give people new cognitive insights into the world, which they would not conceive of independently." (Digitized Nature, 2002)

Digitized Nature connects directly to this project through the fact that both seek to spark a different perspective of the natural world and that both are projection-based media art installations. The influences are mostly on the visual and conceptual domains.

To summarize, different approaches to different problems related to the problem concerning this project. Some are about nature, others more abstract, but they all share a certain innuendo of being focused on the same ideas that give rise to the installation; ideas of inseparability from nature, embracement of natural laws, and of harmony, cooperation, and awakening.

3.2 Natural structures and designs

This section serves the purpose of finding the most common natural patterns and structures across different places, on different organisms, and on so-called "dead" matter as well. Some can be even found outside our planet as we will see in a moment, begging the question: where do the patterns end? These repeating patterns, structures, and geometrical shapes are the basic blocks of reality, and their appearance in different contexts and scales may be a good pointer toward a more fundamental mechanism that generates those shapes.

Here, however, we will make use of these patterns in order to help connect the visitor with nature in general, as these patterns have been shown to have significance to us and to trigger attention responses in most people (Young & Wodehouse, 2018; Robles et al., 2020)

A pattern – according to Oxford Learner's dictionary – is a repeated form or design or the regular and repeated way in which something happens or is done (Pattern, n.d.). A pattern is, therefore, the repeated instances of various natural phenomena, starting with the evolution of life, that took place with one common ancestor and has divided across time in a branching fashion. Or for example the different nearly perfect spherical objects such as planets, liquid drops, or our cells that manifest at different scales. Or the different golden ratios found in the microcosm such as the DNA (Larsen, 2021), the macrocosm in the dimensions of the Earth and Moon, or the frequencies of the planetary cycles (Meisner, 2012).

The pattern is of course imperfect. It generally is, for if we break down the phenomena we will find a level at which the pattern breaks down in some way. Not all patterns are noticed by all people, and some tend to have a better ability at identifying visual patterns, others more social patterns, and others auditory. A pattern is not a property of the objective world, as only through conceptual thinking can we identify a pattern. There is a pattern composed of all galaxies, a pattern of all phenomena on earth, a pattern of all morphological structures, a pattern of human words and symbols, and a pattern that encompasses everything, but we do not generally see it. We only take certain things as a pattern because we evolved for millions of years and have developed sophisticated cognitive skills.

The natural patterns are so intricately complex, and because we have been with them for so long they seem to have some sort of ancestral relevance to our minds and beings. They have deep unconscious meaning to us (Robles et al., 2020; Taylor & Spehar, 2016). They are our roots, and most are alive. They are information about the path of evolution and our story as lifeforms. The different genetic variety of living and healthy (unaltered by human hand) organisms is of great importance to keep the genetic pool diversified and prospering, as well as serve as teachers for different areas of our lives. The patterns show direct and indisputable evidence of the interconnectedness of all things, the more they repeat the more strong the evidence is.

Some of the patterns that will be covered have been shown to be able to invoke attention responses to a statistically significant level. The study in cause supports the hypothesis that humans have evolved to respond and seek such patterns for survival reasons, and specifically that the geometrical structure which underlines those patterns shows potential in evoking attention and interest responses (Young & Wodehouse, 2018).

According to the idea of fractal thinking, we can align our conceptualization of the world with a fractal structure regarding certain phenomena or even the whole concept of the universe itself (Nuhfer, 2007; Reaves, 2016). This is a way for us to structure our thoughts in a way that is not commonly talked about and may bring some interesting perspectives to the table. The affinity humans have with fractals is supported by the fractal fluency theory, which states that we have evolved to seek these structures (Taylor & Spehar, 2016).

The social branch of our fractal universe has a major subset of other fractals: the archetypes; with Jung's archetypes providing a good basis for many recurring social phenomena. The attempt here is to outline what the source of some of the visuals may be, or what the parent set containing a group of objects, fractals, shapes, or phenomena is.

With this following section, we not only share the visual and functional aspects of each manifestation of this paradoxically endlessly bigger and smaller fractal, but also how the visual patterns can be brought together into a scientific-spiritual playground where we may entertain the possibilities and implications of such conceptualization of the universe. There is great value in exploring the concept of fractals beyond the realm of geometry and form and more into the realm of philosophy (Nuhfer, 2007; Reaves, 2016).

As previously stated, the patterns of nature contain functional, aesthetical, and meaningful suggestions for us to adopt, much in alignment with the idea of biomimicry. They work at different levels and interlock in a beautiful dance that is harmonious, efficient, and brings about order to matter. Here are the main patterns noticed on hikes in nature, books, and the internet.

Figure 17 Wave structure in the DNA strand (from: publicdomainpictures.net/pictures/50000/velka/dna-1370603787LgY.jpg)
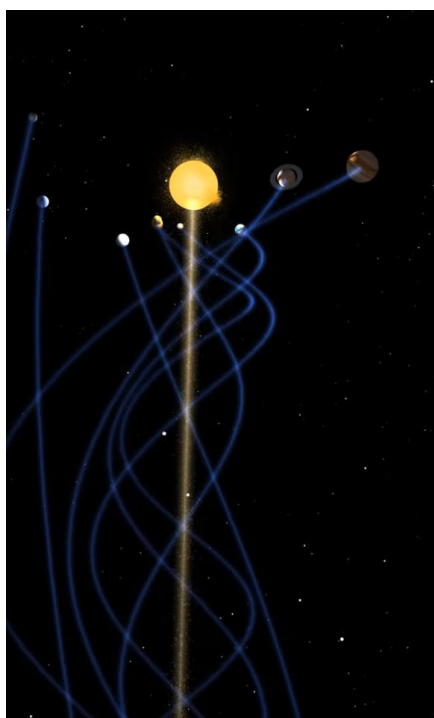
Figure 18 Multitude of spirals and therefore waves in the solar sysyem (from: imageio.forbes.com/blogs-images/startswithabang/files/2018/08/motion_through_universe.jpg)

Sinusoidal wave

The sinusoidal wave may be the most prominent pattern, as it can be found everywhere – because everything vibrates – and at almost all scales in terms of other properties besides vibration. It is generally the result of the bi-dimensional representation of a spiral phenomenon, such as planet orbits or DNA. Everything that oscillates roughly follows this pattern, as the sine wave is traced by the vibration of these phenomena over time or space; photons, sound waves, and even all physical matter leave a sinusoidal trace as they vibrate if graphed properly. The DNA strand like shown in Figure 17 also exhibits a spiral structure, which in essence contains a sinusoidal wave if looked at by one of its axis. Our breathing also roughly follows a wave-like pattern, as we fill and empty our lungs, which tends to slow down near the peaks.

The sinusoidal wave is even found at the planetary scale, as can be seen in Figure 18. The rotation of our planet around itself creates a wave-like pattern in relation to the sun, leading to a very familiar cycle: the day-night cycle. The moon's rotation around the earth is also sinusoidal in nature and dictates our tidal cycles. Even the year is marked by the rotation of our planet around the sun, which again forms a wave as our distance from the sun increases or decreases, dictating our seasons. The whole solar system is traveling in one direction and our planet leaves its trace in a spiral shape – which is a wave when looked at sideways – as it rotates around the axis of the system.

One of the aspects of nature and, in this case, sinusoidal waves is the capacity and even outright tendency to form harmonics. For example, planets are known to harmonize with the frequencies of the orbit of each other in a phenomenon called orbital resonance (Starr, 2021). Harmonious patterns are found when sine waves of different frequencies have been stacked together and form a new pattern that is cohesive. This usually means that the difference in frequency between the two waves or cycles is relatively high; if the frequencies are very close to each other they will not be harmonious; there are numerous combinations of frequencies that generate harmonious results, and that is a whole profoundly complex domain of mathematics of harmonics and musical composition. Our ear is an unforgiving machine of harmonic detection: most humans easily detect even the slightest disharmonic tune in a piece in a very intuitive way. In truth, I believe that most humans have an innate sense of what is harmonious and what is not, not just related to music, but also other forms of harmony, be it visual, cyclical, or social. A musician that focuses on intuitive harmonies and goes with his gut feeling usually achieves more emotionally charged and beautiful arrangements, as opposed to one that attempts to master music with mathematics, algorithms, and logic, although they both complement each other: no single technique is the ultimate technique, and we should strive for eclecticism and balance in all things we do.

Symmetry

43

Symmetry is the correspondence of form around an axis. As with all patterns, we will try to show how they can be seen beyond the geometrical domain, and symmetry can – in a way – be seen in non-physical phenomena.
Symmetry is – first of all – expressed in the duality of things. Symmetry in this context closely relates to the idea of Yin-Yang and balance. The day and the night can be considered to be part of a symmetrical phenomenon or a sinusoidal one, depending on the context. Inner world-outer world, microcosm-macrocosm, or life-death are other examples of a more abstract symmetric universe (Figure19).
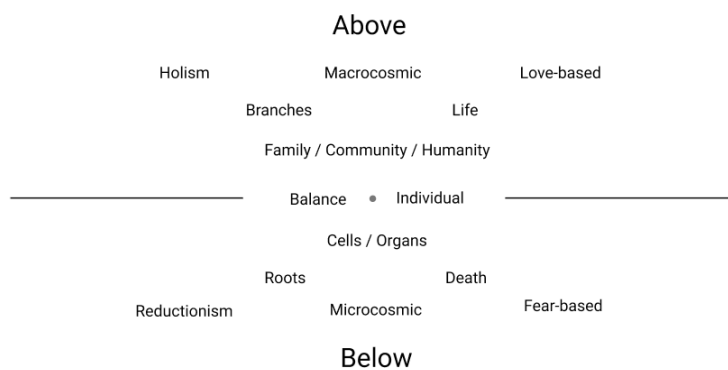
Figure 19 Mirorring of different types of phenomena

Geometric symmetry is either radial or bilateral. In the physical world, it can be found in our body (and the body of most animals), in the sine waves mentioned before, in the root branches of trees, the leaf formations, (Figure 20) flowers,

Figure 20 Symmetry in an opposite decussate leaf formation
(from: jjnet.files.wordpress.com/2010/03/symmetry-in-nature.jpg)

Figure 21 Six sided symmetry in a snowflake (from: 4.bp.blogspot.com/-BfPvwEBLIR0/UrS-BF0xGyI/AAAAAAAAA5s/iG-3wkZ5GEg/s1600/0.jpg)

fruits, or in mineral structures (Figure 21). Symmetry has a very attention-grabbing property, and it seems that humans are specially designed to admire it and seek it. The identification of symmetry is likely the first step in the process of pareidolia: the tendency to identify faces in visual stimuli.

As stated in the introduction of this section, the patterns end up breaking down at a certain point, we can worry about the symmetry of something, but in the end, it will be imperfect. A great beauty of natural designs is the balanced and often alternated mixture of symmetry and asymmetry. It creates a predictable piece with unpredictable details that adds intricacy and character to the design; much like a good song can be characterized by a mastered balance between predictable beats and melodies with unpredictable ones in specific parts.

As said, symmetry can be viewed as the dualistic interpretation of phenomena. Things such as male-female, life-death, or microcosm-macrocosm are, to a certain extent, symmetrical. They are not as symmetrical in shape or form but more in their concept and nature. It is also not necessarily characterized by an exact copy of the phenomenon, but rather by two polarities. The core learning in this perspective has been put by in Hermetic maxima: "As above so below, as below so above", which implies a certain degree of correspondence and symmetry in the universe. This symmetry relating to non-material themes can be a good way at conveying the beauty of the universe and life, as it points out more abstract and synesthetic ways of looking at patterns, which can add a layer of "non-visual aesthetics" to our perspectives.

Branching

Branching structures are a type of fractal structure. A fractal is a self-similar curve, which means that it is an object made out of smaller versions of itself. They all have a fractal dimension, which is a non-integer number that indicates the roughness of a fractal curve (Mandelbrot, 1982).

The fractal nature of branching structures gives this phenomenon the well-known aesthetic that fascinates us and inspires wonder. This has been documented in various studies, one of which concluded that kids develop a solid preference for fractal structures early in childhood, even if not exposed to environments with fractals (Robles et al., 2020). This suggests that it is possible that our preference for such aesthetics is an early biological or evolutionary mechanism that optimizes the visual system for processing fractal patterns.

The branching structure is present in the natural world in many ways. The most obvious branching structure is the branches of a plant (Figure 22). The roots are as well. Our lungs (Figure 23), rivers (Figure 24), veins, and lightning (Figure 25) also follow this structure. Branching is a type of structure that is fractal, but fractal structures are not all branching ones. The branching structure has fractal qualities to it, but they are not the same. A fractal can also be a line, a plane, or a tridimensional shape. A mountain range is a fractal as well, in the sense that the shapes that make up the peaks are found in the smaller irregularities, and in such irregularities, there are rocks whose surface is also jagged.

The branching structure is also found in our limbs. It can also be seen in our brain structures, neurons, and even in speech patterns (Pincus, 2009).
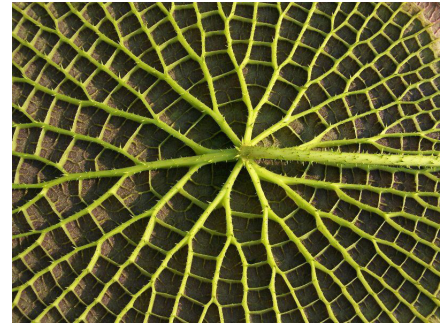
Figure 22 Branching veins under a lily pad (from: https://i.pinimg.com/originals 88/1d/80/881d80c9a2bb863bc489f4b3193435ba.jpg)
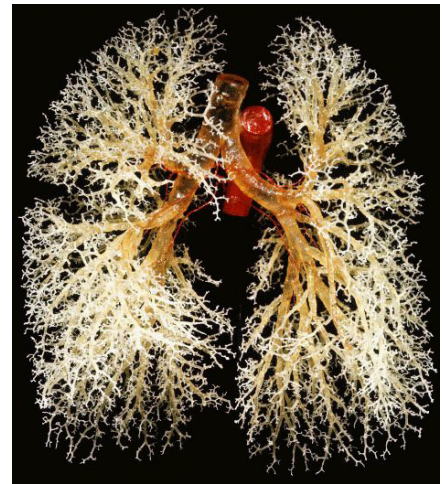
Figure 23 Ramifications of the lungs (from: i.pinimg.com/736x/bc/81/6d/ bc816d776ad1f8a46dd82fac131749b0--fractal-geometrysacred-geometry.jpg)

Figure 24 Fractals in river formations (from: designyourway.net/diverse/amazingworld/28898500626.jpg)

The evolution of the organisms on earth also follows a branching pattern, as they all started by one form of life that split into three main domains: bacteria, archaea, and eukaryote. Each one has branched into different kingdoms, phylums, classes, orders, genuses, and species.

Humans have also – knowingly and unknowingly – created fractals in their creations. The roads and networks of computers are examples of accidental fractal-like structures and designs occurring naturally through us. More intentional implementations include fractal antennas or image compression.

Figure 25 Branching structure of lightning
(from: https://www.sciencenews.org/wpcontent/uploads/2021/02/020421_MT_lightning_feat.jpg)

Phyllotaxis

Phyllotaxis is a botanical concept that refers to the arrangement of leaves or other plant organs on a plant stem. The pattern is quite mesmerizing, as it generally creates spirals. A phyllotaxic pattern has 4 sub-categories: spiral, distichous, decussate or tricussate.

Examples of this phenomenon are only found in the botanical world, but there is an interesting property that connects this pattern with animals and even non-organic life, which will be mentioned later on. Phyllotaxic structures can be found in basically all plants, with the predominant spiral structure being found in pine cones, sunflower seeds, succulents, cacti, pineapples, and many more. Fractal structures can also be phyllotaxic, as it happens in romanesco broccoli (Figure 27).

Focusing on the spiral category of a phyllotaxic pattern - which is probably the most common, or at least the most recognizable - we can see that it creates a two-dimensional lattice (Figure 26). An intriguing property of such a phenomenon is that the number of lines and rows always adds up to two different numbers: numbers that are usually part of the Fibonacci sequence or that at the very least obey the golden ratio. For pinecones or pineapples, the most common numbers are 8 and 13 (see Figure 28).

Figure 26 Phyllotaxis in a succulent
(image from: https://i.redd.it/falrivqa1im51.jpg)

Figure 27 Romanesco broccoli exhibits phyllotaxis and very ordered fractal structures.
(from: https://www.lakewinds.coop/wp-content/uploads/2020/01/Romanesco.jpg)
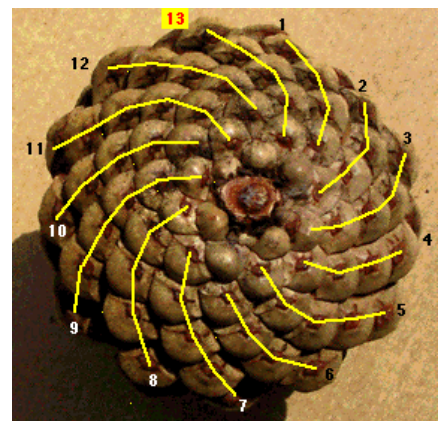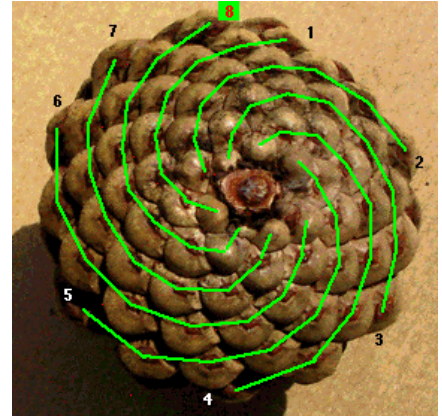
Figure 28 Fibonacci sequence on a pinecone
(image from: https://www.math.uni-bielefeld.
de/~ringel/themen/fahr/fibonacci.htm)
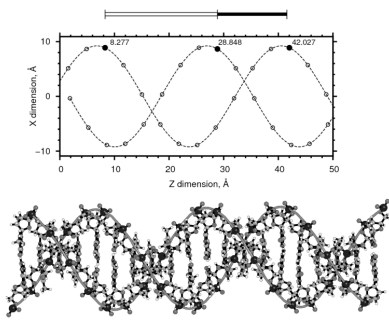
Figure 29 B-DNA viewed axially (Stuart Henry Larsen, 2021)

Figure 30 Phi in the hypothenuse of a triangle based on the diameter of Earth and the Moon

Figure 31 The golden ratio in the pentagram

Golden ratio

As previously mentioned, the phyllotaxic pattern is only found in plants. However, the Fibonacci sequence found in most phyllotaxic structures transcends the botanical world. We have found approximations of the ratio in many seemingly unrelated phenomena, which we will cover in a moment. The actual ratio and the Fibonacci sequence are not quite the same things. We can take two consecutive numbers of the Fibonacci sequence (preferably big numbers) and divide the biggest by the smallest and we will get an approximation of the golden ratio which is usually represented with the greek letter φ (Phi) (Corbalán, 2021).

It is described as a ratio where the total sum of both numbers is to the largest number as the largest is to the smallest. The value of φ is 1.618033...

The golden ratio is one of the most prominent patterns in the universe. It is not only found in living organisms, but also on nonliving matter, which makes it profoundly mysterious and fascinating. For a quick example of a natural approximation of the ratio, one has to look no further than their own arms: the ratio between the size of the palm and the forearm is roughly the golden ratio. It is also in other parts of the human body. On a deeper level, it even appears in the B-DNA strand which is the fundamental molecule for life on earth as shown in Figure 29 (Larsen, 2021).

The ratio also makes its appearance at the planetary level. The rings of Saturn have a gap, and the bigger ring and the smaller outer ring roughly follow the ratio (Meisner, 2012). If we scale Earth down to have its diameter be 1, and if we scale the moon with the same ratio, we can consider the sum of them to be equal to one side of a right triangle and 1 to be the other side and the hypotenuse will be the golden ratio with 4 decimal places accuracy (Meisner, 2012). See Figure 30.
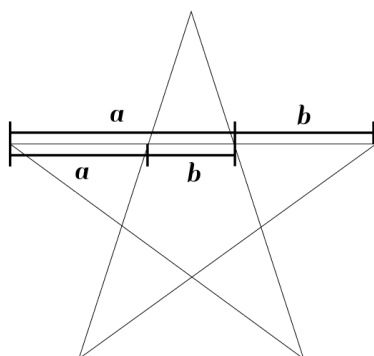
From a geometrical standpoint, we can find the ratio in many simple constructions. For example, the pentagram contains the golden ratio in the intersecting lines (Figure 31).

The fact that the ratio is found in nonliving matter excludes the possibility of an evolutionary preference. It seems more like an emergent phenomenon that is the result of a fundamental force or optimal equilibrium, just like we have spheres or hexagons in living and nonliving things from the microcosm to the macro.

Turing pattern

The Turing pattern is a visual phenomenon that is observed abundantly in the natural world. It is usually seen in the skin and fur of animals (Figure 32 and 33), but can also be seen in corals or even in the tubular shapes of the brain. The concept of the pattern was introduced by the mathematician Alan Turing in 1952 and it proposes that the resulting wavelike patterns are the chemical basis of morphogenesis. The fundamental mechanisms of a Turing pattern are explained by the model of reaction-diffusion. A reaction-diffusion system is a mathematical model that simulates the reaction of two or more chemicals with each other while also diffusing and spreading over the surface.

Figure 33 Turing patterns in sand and zebra fur
(from: qph.fs.quoracdn.net/
main-qimg-56ec67931aef620b70335597ebba76e8)

Figure 32 Turing pattern on a fish
(from: images.theconversation.com/files/281654/original/file-20190627-76701-tojybz.jpg)

The reaction-diffusion systems are generally used in chemistry, but they also prove to be useful to model non-chemical phenomena, such as biology, physics, or ecology.

The aesthetic aspect of such patterns is relevant for this project, as it is another pattern that is present in nature and that we have evolved with for a long time. Such patterns may signal to our brains the presence of an animal (prey) and hence our evolutionary tendency to seek and process such patterns. The Turing patterns and the Voronoi patterns have a slight overlap in some of their appearances; for example the mechanism behind the fur color of a giraffe follows the chemical reaction-diffusion model but results in a Voronoi pattern. This is probably due to the highest degree of diffusion of one of the chemicals, which results in a fur color being more spread out and the other color becoming something of a boundary between each spot which is basically the mechanism behind the formation of the Voronoi patterns, which we will go over in a moment.

Such patterns are very recognizable and have a distinct aesthetic. We will make use of such patterns to immerse the visitor in the natural world by invoking the aesthetics of fur and skin on simulated living creatures.

Voronoi patterns

Figure 34 A Voronoi / reaction-diffusion pattern on a giraffe's fur
(from: static.scientificamerican.com/blogs/
cache/file/EDBC5D79-80D3-4B7E-
862DDD150B7A1627_source.jpg)

Figure 35 Voronoi pattern on limpets
(from: cosmic-core.org/wp-content/uploads/2019/01/
hexadnature6-1024x619.jpg)

A Voronoi pattern or Voronoi diagram is, in essence, a set of points that are the cells' nuclei. Each cell is composed of a region and the nucleus, and in a given region we know that any point in it is closer to that cell's nucleus than any other cells nucleus; in other words, we can delineate a region by calculating the average distance between two closest points and defining a perpendicular line to that distal line which will define the boundary between two cells, as shown in Figure 36.

The Voronoi diagram has many useful applications, such as finding solutions to the Nearest neighbor search problem, simulating fractures in computer graphics, creating organic, strong, and flexible structures in architecture, or in biology to model and analyze plant competition. (Drysdale, 1993)

It can be found in many natural phenomena, starting with the way cells stack. It is found in the wings of insects, fur patterns of giraffes (Figure 34), on limpets (Figure 35), on the skin patterns of fish and turtles. On nonliving things, we can spot Voronoi patterns in the way bubbles stack (this has the interesting property of allowing us to see the Voronoi pattern in 3D) or in the way cracks appear as the land dries. It invokes a network aesthetic by the way the lines branch out and connect with each other.

It could be said that some of the hexagonal patterns are in fact Voronoi patterns where the cells have been placed in the most surface-efficient circle packing, which is the hexagonal packing.
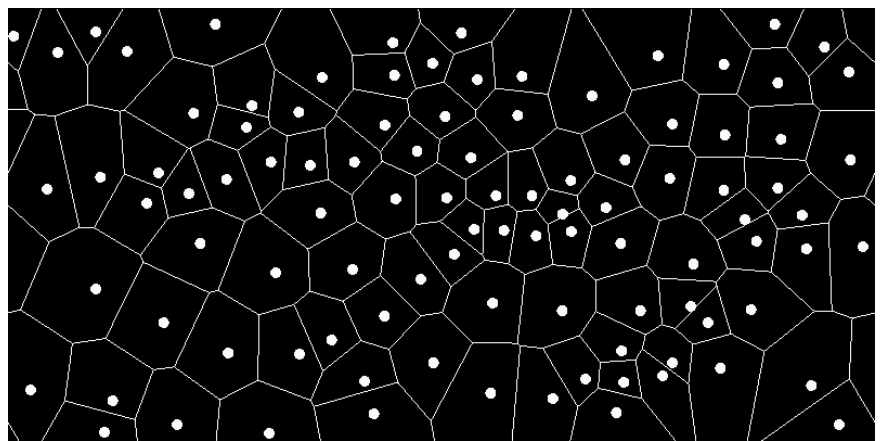
Figure 36 Voronoi diagram cells and corresponding cell nuclei
(from: leatherbee.org/wp-content/uploads/2018/10/100plates3relax.png)

Hexagonal patterns

The regular hexagon is a stable, six-sided polygon. It is the most space-efficient way to tile a surface, according to the honeycomb conjecture (Hales, 2001). The hexagonal tessellation is also a structurally strong shape, as they form three-sided joints that are all 120 degrees apart. This means for the least material we get the most mechanically stable arrangement, as pulling from one joint spreads out the mechanical force in two directions. Graphene is the strongest atomic material we know and it is so due to its hexagonal tessellation. A group of spheres of equal radius placed on a two-dimensional plane will always pack in a hexagonal fashion, which is why tubes such as our photoreceptors or bubbles will form hexagonal lines.

We can see that the hexagon shows up in nature a lot, perhaps through the natural mechanisms of life and minerals that seek to organize matter into more efficient and harmonious shapes. It is seen in beehives, the photoreceptors in our eyes and the eyes of most animals, on the molecular geometry of chemical bonds, on basalt and other mineral formations (Figure 37), snowflakes, the patterns on turtles' shells, and even on the north pole of Saturn (Figure 38).

Figure 37 Hexagonal basalt formations
(from: pbs.twimg.com/media/Cph9NwvXgAAobDN.jpg)
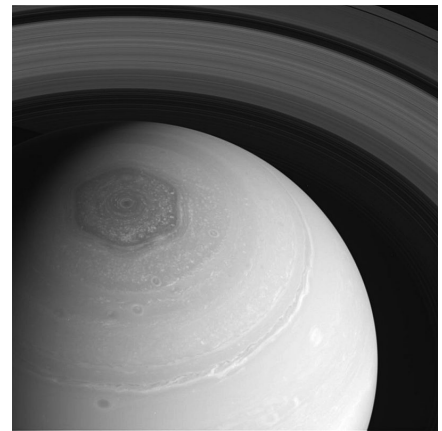
Figure 38 Hexagonal storms at the north pole of Saturn
(from: earthsky.org/upl/2020/05/Saturnhexagon-rings-Cassini-Nov-27-2013-800x800.jpg)

3.3 Sound and healing

Sound and music are fundamental to the project, both because they are very central in human life, but also because to create true immersion in the experience the dimension of sound must be explored. Music and sound are central to many spiritual practices and the usage here was also holistic. For the context of this installation — and given that the purpose is not only to show the interconnectedness of life, but also to instill peace, presence, or gratitude — music was mostly seen as a tool to reinforce that peace and relaxation. We will begin by establishing what frequency, sound, and music are.

The sine wave structure, as mentioned in the previous section, is how sound behaves at a fundamental level. We can extract the composing sine waves of a sound using the Fourier Transform (Cochran et al., 1967). A sine wave has a frequency and amplitude. Frequency refers to the number of cycles of a specific phenomenon over a period of time. Usually, it is used in the context of sound acoustics to measure the pitch of a sine wave or sound. Amplitude refers to how intense that vibration is (Berg & Stork, 2005). This vibration, when originated from a sound approximating a sine wave, such as singing bowls, gongs, or binaural beats is a mechanical massage of a specific frequency, which will resonate with different parts of our bodies due to the different resonant frequencies different organs have. Besides the subtle internal massage, the melodic and harmonious sounds of gongs, bowls, or bells boost the relaxation and may add a layer of musical appreciation by the person which enhances the mood improvements experienced. Science has recently established that everything vibrates, meaning that everything has a frequency of vibration and that opens up a whole series of questions regarding the mechanisms and implications of harmonious vibration of two or more entities or objects.

Sound, in physics, refers to the propagation of a wave of mechanical energy through the air. The origin of the sound is the movement of air as an object displaces that air, such as wind in woosh type of sounds or two objects hitting each other such as a rock falling, a drum being hit, or a string being plucked. A sound can be loud or soft, corresponding to a low amplitude or high amplitude of the composing waves (Berg & Stork, 2005). It can be noisy or tone-like, the more it resembles a fundamental sine wave. Sound can also be referred to — in physiology and psychology — as the reception and interpretation of such input by the human brain. A sound is in that context, the direct, subjective experience of sound by any organism capable of hearing. It is important to note that some organisms may experience sound without hearing it, through the mechanical pressure it applies to their bodies.

Music is central to human life, as it is the constant evolution of the masterization of frequency, sound, and expression. Music is the psycho-spiritual phenomenon of decoding expression and emotion in sound. Because of this — similarly to spoken language — otherwise meaningless sounds and noises are interpreted into a coherent piece that evokes ideas, feelings, emotional responses, or memories (Born, 2013). It tends to manifest itself as a continuous, unified, and evocative piece that makes use of melody, harmony, rhythm, and timbre.

As such, a prior study of different spiritual and medical usages of sound, music, and frequencies was conducted. For example, the protocol for psychedelic therapy includes music during the session to guide the person through the experience. This protocol is outlined by Kaelen et al. (2018) and served as a conceptual reference because of the phenomenological impact of music in the subjective state of the person, but also technically, as it leads the track selection of each space to use calmer tracks for the initial parts of the installation. The neurologist Oliver Sacks (2007) also shares a series of psychological and physiological pathologies and their connection to music, which further influenced the intention of using music as a tool to aid healing or in the very least a sense of well-being.

New Age music was also very influential in the development of the soundtracks. The genre is focused on using music as a means to achieve calmness, presence, or spiritual insight using – among many other techniques – it is an umbrella term that can include group chants, singing bowls, nature sounds, kirtans, Medicine Songs, etcetera (Becker-Blease, 2004; Dayal, 2016; Rittner, 2007). New age music is therefore a fair label to apply to the tracks being produced for this project, though other labels could include Ambient or Shamanic.

Sound healing or the usage of sound to aid healing processes was also very important in the concept of playing sound as healing or helping relax in the case of the installation. This is related to Medicine Songs, which is not only a type of shamanic musical expression, but also a form of folk technology used for healing (Villena, 2021). Medicine Songs or *Musica de Medicina* as commonly known in some indigenous tribes of the Amazon, are songs – some old, some modern – of great power and beauty. They speak about healing, communication, love, understanding, and nature and are frequently played in ceremonies with entheogens, because of their uplifting and empowering lyrics, usually sung in glossolalic languages and native languages like Quechua – usually referred to as Icaros – or in Spanish, Portuguese or English. Most songs are played with instruments such as guitars, charangos, flutes, shamanic drums, shakers and others (Villena, 2021).

Shamanism employs not just music but also noises to achieve certain ends. For example, drums, shakers, mouth noises, whistles, blows, whispers, and singing are all very commonly used techniques by many shamans (Villena, 2021; Winn et al., 1989). As previously mentioned, Medicine Songs uses singing as a way to heal (both passive listening and active participation). This connects to the practice of Kirtan found in Hinduism, Buddhism, and other Eastern spiritual practices. Kirtan consists of singing or reciting mantras, stories, or songs in groups, using instruments. It is a devotional practice that has many social, physiological, and psychological benefits. For example, mantras and singing in general, whether sung alone or in a group, have been shown to have beneficial effects on the body and mind. Singing bowls (Hinterberger & Walter, 2022) have been shown to aid well-being and were two concepts directly included in the musical development of the experience. We may begin to discover that the different quantitative parameters of sound are not as important as the intentionality from the healer / musician.

4. Methodology and Work plan

4.1 Methodology

The process of work chosen for this project was the Double Diamond (Figure 39). The design thinking method is appropriate for a work of artistic nature such as this, as it does not strictly enforce a way to fix an issue, but rather allows for a flexible and organic way to establish a problem and to gradually develop a solution in order to arrive at the goal.

The problem started to be, in short, the human disconnectedness with nature, and has evolved subtly into something more along the lines of "individual human well-being as the central pillar for reinforcing community and nature connectedness". The research phase of the first diamond was highly iterative and sought to understand the problem better and to be more precise in what was trying to be solved. The research led to slight pivoting in the project direction, something that designers are very accustomed to.

The next phase of convergence had the goal of bringing the dispersed information into a more cohesive shape and it began with the consolidation of a visual language, an auditory language, and a whole environment. This second phase of the double diamond was where the conversion of the concepts and references came into a multimedia artifact, making use of
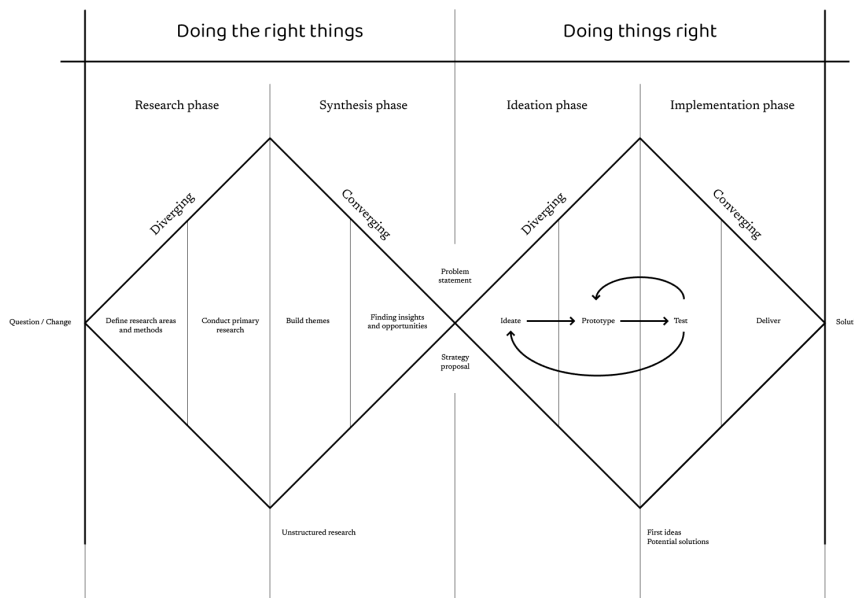
Figure 39 Double Diamond Process. Choosen design thinking methodology for the project

iterative increments and evaluating those formally and informally with people. The creation and refinement of this written document is also the result of this phase of the process. In the converging phase.

4.2 Work plan

The work plan sought to use a Gantt chart for time and task management. For the project, the chart was outlined before the intermediary delivery, which gave a rough idea of what was going to be done and at what time. The main tasks are three and each has sub-tasks. The structure of tasks and the respective Gantt chart is found in Figure 40.

The actual timeline underwent change throughout the process, as a better refinement and structure of the components of the installation was needed and this ended up delaying the original planned delivery date from September to January. The cohesion and refinement of the visuals, the sound, and the space organization was deemed fundamental and this meant that a delay would be justified if the tests end up being conducted with a well-built artifact. By delaying, we ended up moving the evaluation to November and December, which negatively impacted the testing of the experience due to the cold weather, yet gave the experience more coherence and refinement. The final chart is shown in Figure 41 and in it, we can see the calendar that ended up being followed.
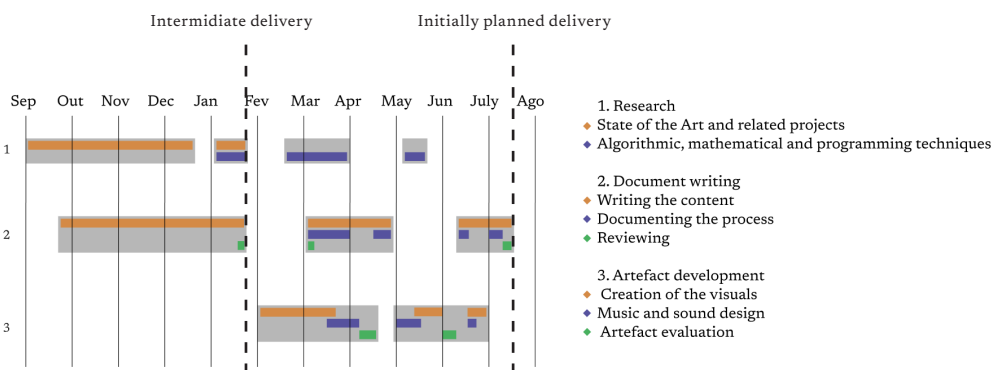
Figure 40 Gantt chart as initially planned
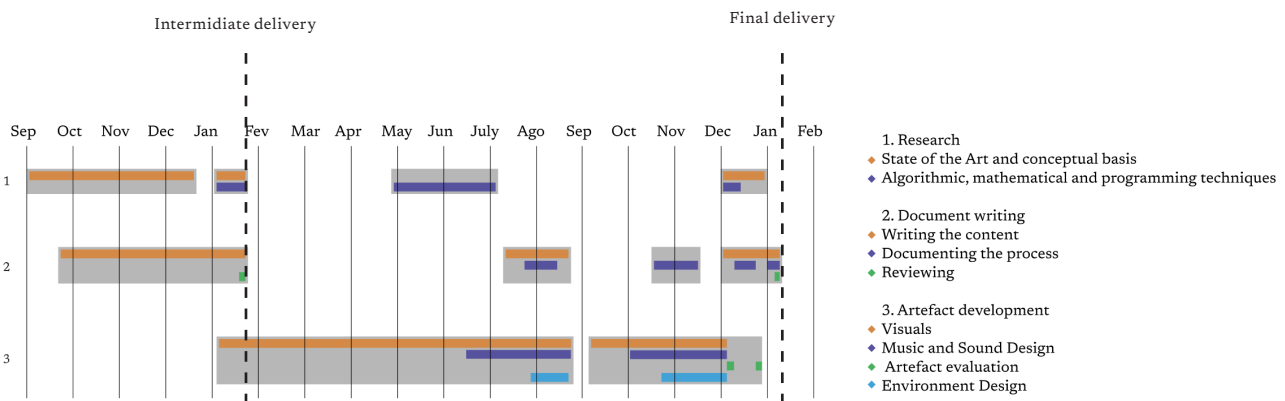
Figure 41 Gantt chart as of the actual process

5. Conceptual development

5.1 Problem definition

Pinning down the problem into a short statement was not an easy task; the problem of human and nature connectedness is related to multiple other deeper collective problems such as depression, tribalism, excessive ego, pollution or consumerism and they are all relevant to the message being shaped here. Boiling the issue down into a few words, one could say that the problem is that human collective consciousness is slowly losing touch with the spiritual reality, because of the recent liberation from religious dogmatism by the means of modern science, and this has put the sacred, the spiritual, and faith as the target of constant skeptical attacks, even though these things have some of their mechanisms based on the exact opposite doctrine of skepticism; that is, some of the attacks are pointless and are missing the point of faith. The core problem is, in a resumed way, that humans are starting to enter mind traps of too much thinking, where they allow ideas of separation to become confirmed and fueled; where we start believing we are different, better, more important, etc. because of various reasons which leads to apathy, division and ego. The issue gets serious when people justify division by any means. This means that the perceived separation is so strong one would even strongly defend it and act upon it.

The situation we find ourselves currently in, as already mentioned, is characterized firstly by the factual and evident ecological state of the planet and population numbers (Ekins & Gupta, 2019; McRae et al., 2016). It is then characterized by a more subjective, but still observable sense of division and hopelessness. This can create depression, anxiety, suicide, and a lot of suffering. The tv, news, and apps can be informative and engaging but detrimental to our health (Strasser et al., 2022). Mainstream pop-culture movies, series, music and games may perpetuate violent and toxic relationships and lifestyle habits in a way that people do not notice but end up bringing into their own lives. The food industry captures us with colorful brandings and tasty processed meals; a very processed diet leads to gut bacteria imbalances, which are now being studied as the potential causes for depression, Alzheimer's, and other diseases (Askarova et al., 2020; Choct, 2009). The constant threat of nuclear war or economic or environmental collapse is also great on people's minds.

Some people will not see things in such a bad lens, but the majority has either not yet understood the seriousness of the situation or has already understood the power we possess as individuals and communities and are optimistic of the future. The rest is likely stuck in a place of deep fear and numbness and apathetic as to what is going on (Nagel, 2005). Those who understand the issue but are not hopeful are actually in a quite dangerous situation, as it enables a selfless, careless, and doomer mentality that only exacerbates the issues; such mentality perpetuates the problem because to those people there is no salvation and therefore no effort to be sustainable is seen as worthy. One can easily adopt a stance of hopelessness and use that to justify unsustainable behaviors, and this is a collective danger, as it takes the responsibility for our actions from our hands .

So, to define the problem being tackled, we must talk about what is causing this division. We are culturally educated to reinforce apathy and division, when we perpetuate – consciously or subconsciously – old fashioned ideas about races, religions, sexuality, consumerism, or status. At the same time, the archaic ideals and old ways of being must not be forgotten, and we must remember how we lived and try to revive old rituals of human community and brotherhood (McKenna, 2004). The problem that this project seeks to address can be resumed to extreme collective nihilism, scientism, extreme reductionism, and extreme materialism. We see that meaning, love and sacredness are, to many, nothing more than mere chemicals in the brain; experiences that are flawed and should not be trusted. This undermines and denies the very core of our being. It is true that emotions and perception are at times flawed, but that shouldn't make us completely ignore and abandon these experiences. It is also true that these experiences are mapped to neurochemical activity in our brain, but the qualitative, subjective aspect of the experiences is also real and relevant to discuss. Things are not just physical, for we have evolved a projected conceptual and cognitive layer of perception, such that saying love is just physical is as silly as saying music is just physical: they are of course reducible to their materialistic aspects but are also composed of their metaphysical components, the subjective experience; in the case of music, it is more than the air vibrating and interacting with our brains (that is actually called sound), but also the emotional charge or the memories they trigger; (Rittner, 2007; Becker-Blease, 2004; Bonny, 1986) the qualitative object that is only possible to understand through direct experience and empirical inquiry. It is not reducible, as it is qualitative and subjective, the only real thing: the here and now.

The problem is in a way related to the fact that the scientific method (Liebel, 1964), math (Muller, 2021), and language (Capra, 1975) all have their own limitations. This means we can not know everything. It should not keep us from trying, of course, as the more we learn the better. But in essence, it humbles us into accepting that with our current linguistic and expressive models we will not be able to understand an ultimate objective truth, ever. Our tireless efforts to explain, dissect and model everything in the universe have led us to forget the very reason we try to explain, dissect and model the universe: to ease suffering, improve lives, and generate wisdom. By becoming so focused on knowing, we forget to just be. While so focused on the transcendental objective reality, we forgot that we will never experience something besides our subjective lens. The here and the now, alongside what we feel.

To some, one of the biggest problems of the world is that not enough people understand science or misunderstand it, leading to crazy conspiracy theories or mass delusions. This is absolutely a problem, but alas, it is not the problem this thesis seeks to address. The focus of this project is the problem of over-rationalism; the problem of extreme reductionism, materialism, and hubris. Regarding conspiracy theories, the best tool to fight them is transparency, which is something that governments worldwide avoid. Transparency and education.

"The mystery of life isn't a problem to solve but a reality to experience."
-Frank Herbert (Herbert, 2006, p.562)

If our problem is that we believe too firmly in the narrative of the ego, then we give this illusion of separation too much force, and we can not love each other fully. "Love" here can be often misunderstood; it is not meant the romantic or erotic love that the modern Western collective consciousness usually associates with the word, but rather it is meant the broader definition of the word: deep affection. Affection and care are not just shown to our partners. Love is our recognition of the non-separation, love is service, protection, and presence. Humanist values, environmentalism, and civil rights are embodiments of this loving energy. Love is like a substance that unites humanity and the planet.

According to the non-dual perspective, there is only one entity, one original consciousness expressing itself as different, and therefore any hate or harm projected to "other" is basically an attack on the self. The ego is useful to "lock" noble and virtuous ideas in place so that we do not get talked out of them in the future, or it protects us from acting rashly and violently; but what are those "noble" and "virtuous" ideas specifically? That is what each one of us should meditate upon regularly, or in other words: to keep our ego in check. So, the ego allows virtuous and sincerely good ideas to remain in our social fabric, while the empathic aspect of us allows us to reach understanding and forgiveness. When we talk about temporarily letting go of the ego, it is important to understand that we should never try to get rid of our sense of self permanently. The ego is necessary and useful for now, in our current social and evolutionary paradigm; experiences of non-duality are and should be temporary, integrated into one's daily life by the means of weaving the mystical into the practical (Cosimano, 2020).

The problem, then, boils down to our disconnection from our bodies, our communities and our mythical mother: nature / the planet earth. Overthinking and overanalyzing, leading to anxiety and a detachment from reality. Our overly materialistic stance makes it easy for nihilism to take hold of us and to induce us with existential dread as we see the universe as a mistake, a result of pure chance where dead matter came together to form a freaky phenomenon of consciousness and suffering. Our overly rational mind is not going to help us when it comes to meaning, as said by Søren Kierkegaard. We are putting a lot of faith on science alone, and are forgetting the rest of our human capabilities and dimensions of being.

5.2 Conceptual basis

Next, we will explore the interconnectedness of non-duality, Gaia's Theory, sustainability, biomimicry, visionary art, and shamanism. Through careful research and analysis, we will demonstrate how these concepts all point to a holistic understanding of the world, in which all beings and systems are interconnected and interdependent. The integration of non-dual philosophy with the study of ecology and sustainability provides a deep understanding of our place in the natural world and the impact of our actions on the earth (Capra, 2005; Fletcher, 2017). Biomimicry, biosemiotics, visionary art, and shamanism offer practical ways to connect with this understanding of our place and integrate it into our daily lives; Biomimicry and Biosemiotics in the scientific side of the knowledge spectrum, and visionary art and shamanism on the spiritual side of the knowledge spectrum. As of now, it is only important that the reader takes note of the importance of using these interconnected perspectives in order to create a more sustainable future for all.

Non-duality

Non-duality is characterized by a direct engagement with the present moment without the imposition of perceptions, concepts, evaluations, or boundaries onto experience (Gill et al., 2015). It defends that everything is fundamentally one single entity or consciousness, and duality is like an ilusion to generate experiences and contrasts.

The scientific reports we have of mystical experiences have a characteristic that is common in virtually all occurrences: states of non-dual awareness (Michael Pollan, 2019; Shrader, 2008). The paradoxical state is likely where the results emerge, as it allows for a fundamental shift in one's perspective. Non-dual states of awareness are characterized by a merge between in and out primarily; this creates in the subjective experience of a person feelings of dissolution of the physical and mental barriers. Not only this, but the implications of non-duality are that one sees how good and bad are not as fixed as we want them to be. Or they will at times show us how and why we are connected to other people and the whole planet.

As previously mentioned, the reduction of the Default Mode Network (DMN) of the brain is associated with a sense of oneself dissolving (Carhart-Harris & Friston, 2010; Michael Pollan, 2019; Millière et al., 2018). But non-duality is not just an intensely subjective experience of ego dissolution. It can also be a way of being. To live according to the fact of non-dual existence. When we try to see the gray tones, the nuance; when we look at the phenomenon of photosynthesis and breathing; when we look at the water cycle; Life and death.

Non-duality goes hand in hand with mysticism due to the phenomenological overlaps such as the common characteristics of no-self. It also goes hand in hand with the concepts of deep ecology and ecosystems as they all recognize the interconnectedness of all things.

Gaia's Theory

The Gaia theory has gained momentum among the scientific community. The radical attempt at redefining what constitutes life has been faced with valuable and legitimate criticism. But nonetheless, the theory has been revised, and it is now more solid than the first hypothesis. In his book, James Lovelock (2016) points out that the self-regulating systems of the planet could be responding to our intense intervention on the planet. This is not done by an intelligent being (although intelligence is another tricky concept) but by a series of millions of different feedback systems at different scales (from the microscopic regulation of gasses in the ocean by algae to the rainfall and volcanic eruptions). He states that organisms adapt to the environment but that they also change it. The planet earth is, in essence, a living organism that due to its complexity is not yet commonly recognized as living.

The planet can not reproduce, so how is it alive? A possible example of reproduction at the planetary scale could be explained by the Panspermia hypothesis (Burchell, 2004), which states that life can be "copied" from planet to planet on asteroids or space dust. This doesn't explain the origin of life, but it shows a very similar mechanism to cell division and reproduction, but on a planetary dimension.

The importance of recognizing the planet as living is great. Many of the core arguments against the current human behavior are that it will eventually have an impact on us — that argument has been used in this very document — but what if there were no consequences for us? Would we stop caring about the planet? Why is the more compelling argument an argument about consequences and not simply responsibility? We can kill animals for their food without consequences, but it begs the question of whether or not we sourced that meat ethically, as animals feel pain and do experience emotion. So, we have to be humble and responsible towards life in general, even if it does not feel pain. Just like the gut bacteria has no clue that it is part of a human, the human has no clue it may be part of a bigger organism whose form and function is unimaginably and radically different from itself.

The concept of Gaia connects to the previously mentioned simplified description of the project's goal — encouraging a strong sense of community with humans and non-humans — because it is the very first step in encouraging such sense of belonging with a non-human entity that is earth, mother earth, mother nature, the global ecosystem, Gaia. They are all different names for the same concept. It just so happens that the indigenous, and people living off the earth tend to refer to this abstract entity through more affectionate names, such as mother, which helps the sense of connection be higher than if just referred to as something colder as "the global ecosystem" or "series of self-regulating systems". It is not that the earth is not composed of such systems and ecosystems. It is simply that by referring to her as a mother we create a bond and that attributes meaning and anthropomorphizes. Such a bond and affectionate link would unlikely harm us, quite the contrary. This is seen in South American indigenous shamanic cultures, where some groups refer to an

entity called "Pachamama" (Murphy, n.d.) which is akin to the concept of mother Earth. They also refer to forests, rivers, and plants by family member names such as "Mother", or "Grandpa" (Barbachano, 2019). The animistic perspective may be a relevant aspect when it comes to this strong sense of union with nature that ancient indigenous traditions have, although the Taoist perspective is not animistic by nature and yet equally encourages this sense of connection with nature and life in general.

Overall, Gaia's theory is a more scientific window to the mystic message being attempted here. It helps bring validity and reputation to the ideas of planetary unity and interdependence. It fits the project's theme as it supports the idea of spirituality in the sense of individuals feeling part of something bigger.

Sustainability

Sustainability is a keyword when discussing balance and homeostasis in our planet. It is the major key topic in today's discussions. Both in terms of environmental sustainability, but also societal. We have seen good progress in the area of sustainability, but a lot of work still needs to be done, namely with the production of items that are not crucial and made of materials that are not degradable, selling products in bulk, less plastic, promoting biodiversity and forests especially in cities, among others. The sustainability goal is to help nature with her renewing cycles by slowing down our own.

To reach a sustainable plateau we need to change the focus from massive produce and profit, to decentralized food sources such as food forests and permaculture projects. These practices can help alleviate the usage of land and pesticides, because even though it is less efficient and profitable, it is more organic, and sustainable, helps local flora and fauna, and also is the most resilient. With new technology also available — and so long that technology is itself sustainably manufactured — we can have more efficient gardening, and better maintenance of the crops. We can make use of State of the Art greenhouses and growing techniques such as hydroponics and vertical farms to help solve the issue of land usage, pesticides and transportation emissions. Agroecology is also related, as it is a scientific approach to investigate ecological principles, processes, and functions in agricultural systems in order to create sustainable agricultural systems (Krebs & Bach, 2018).

Permaculture is a result of the agroecological field of study and consists of farming systems that are based on design principles that seek to create strong, interconnected, self-balancing, permanent spaces where local flora, fauna, and fungi work together with almost no human intervention while producing plenty food and other natural provided services. It seeks to mimic natural interactions and optimize them, by guiding the design, implementation, and maintenance of resilient agroecological systems (Krebs & Bach, 2018).

The sustainable goal is to change our cultural habits of consumption. To change the focus to producing and nurturing, preferably not even expecting to gain anything with such nurturing, like a mother nurturing her baby without expecting him to pay back. The services ecosystems provide us with if treated correctly and with respect can be seen in Figure 42. We have to not only adopt such habits of buying less and more green, locally, more sustainably produced and wrapped products but also pressure governments to make such changes happen.

Another issue that is threatening sustainability is the greenwashing phenomenon. Greenwashing is when a company or institution states and appears to be sustainable, but are only using word games, deceitful tactics, and other marketing tricks to mislead consumers (Robinson, 2021). Given the enormous power of international conglomerates and their negative
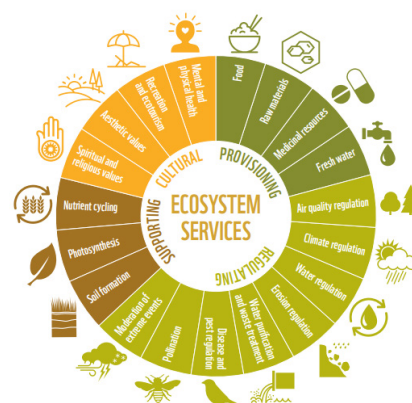
Figure 42 Natural self balancing and service providing systems (McRae, et al., 2016)

impact, those types of practices – plastic mass production, non-sustainable practices, money laundering, worker exploitation, etc. all while appearing healthy, sustainable and friendly – must be heavily sanctioned and sustainable programs and initiatives must be more founded.

Sustainability is also a way of organizing our communities, seeking to take the resources at a lesser rate than the rate of natural regeneration of a given resource or organism (Capra, 2007). This means we try to change our communities' focus progressively towards local growing of food and water filtration to reduce transportation of these two main products for human well-being. Plus, the cultivation of food as a community and the interaction with a natural setting can help with the stress aspect of today's world, as one of the services provided by nature includes mental well-being.

Sustainability is also manifested in the attempts to create new systems and communities that take the issues into their own hands, instead of waiting for governmental action. Eco-villages are becoming more common and a reaction to the global situation, in a moment where humanity is letting go of the fundamentalist materialism (Lüpke, 2012). Ananda valley, Tamera Healing Biotope, and Awakeland are all Portuguese eco-villages part of a global movement happening on a local level that pretends to tackle global issues through communities that work to embody holistic thinking, nature connectedness, permaculture, and other neo-humanist values. These villages are labs for the exploration of more efficient farming and social structures, using our scientific knowledge but keeping technological use to a low, taking matters into their own hands instead of waiting for governmental programs or measures.

Related to these movements we find PROUT - progressive utilization theory, which offers an alternative socio-economic system that is centered around both people and the planet. It is rooted in ecology with a vision of the future beyond both traditional capitalism and socialism, by supporting economic democracy, local economies, and worker-owned enterprises. The system aims to shape a vibrant ecosystem, one human society, and an economy for all (Powers, 2018; What Is PROUT?, n.d.).

Another relevant movement connected to the topic of sustainability is Solarpunk. Solarpunk is mainly an artistic movement that envisions how the future of humanity can look once we overcome major challenges regarding solar energy, pollution, sustainability, and climate change (Hunting, 2021). It was created as a reaction to the dystopian and apocalyptic themes of Steampunk and related genres. It often depicts high-tech cityscapes with abundant trees and natural elements mixed in (see Figure 43). The social themes often include egalitarianism, absence of poverty, or abundance of resources in a sustainable way. It is of course just a fictional artistic movement, but the core sentiment is very much in line with the goal of this experience. The concept and principles of this movement served as inspiration for the materialization of the final artifact. Related to the Solarpunk movement is the visionary art movement which will be expanded in time.

Figure 43 Solarpunk painting
(from: static.wikia.nocookie.net/aesthetics/images/d/d2/Chobani_Ad_1.png)

Regarding the theme of the dissertation, sustainable activism is the result of the change in perspective from a dual, separated, and hopeless mindset into a holistic, hopeful, and connected perspective. The love for nature and the planet is at the heart of the sustainability principle, and such love is one of the core messages of the project being developed here.

Biomimicry and biosemiotics
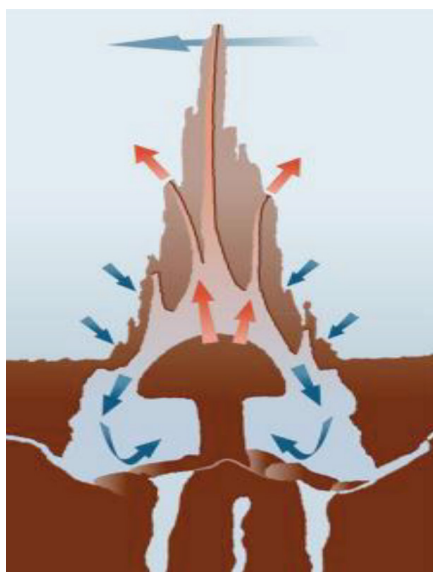
The concept of biomimicry – also called biomimetics – can be described as a design process that seeks to find new, better, and sustainable solutions to problems by turning to nature as inspiration. It does so by studying nature's processes, structures, patterns, and systems in order to understand how these can be used to develop new technology and solutions such as shown in Figure 44 (Mathews, 2011; Pushpraj, 2020). Humans have evolved to achieve rather niche finalities, and although our intellect is great, it doesn't compare to the knowledge of the whole of nature, as each species specializes in a few tasks. We can quickly and effortlessly implement, for example, efficient aerodynamic shapes by modeling the shapes of the beaks of birds. The bird has evolved for thousands of generations, and has solved the problem of aerodynamic performance by trial and error of the genetic mutations and selection of the fittest.
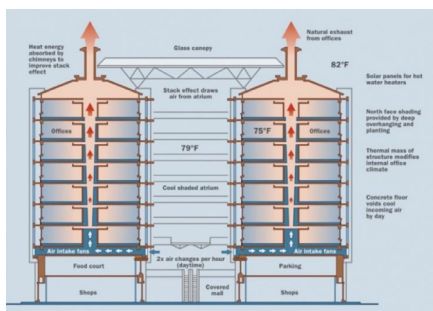
The technology nature developed by evolution alone is immense, as different classes, genus, and species have specialized in certain tasks that we can analyze and use to implement and adapt to in order to make use of the evolutionary solution for those problems and also to align our attitudes and creations and functions of most lifeforms (Mathews, 2011; Pathak, 2019; Pushpraj, 2020). They save us a lot of brainstorming and point us towards the right direction, for nature didn't only evolve to be locally efficient – at the individual level – but also to be globally efficient and to work harmoniously with the rest of the environment. This is because nature does not maximize its parameters, it optimizes them (Capra, 2007).

With this principle in mind, we could learn more than just aesthetics and structures. We can note and learn how nature behaves together, how living organisms live together, and perhaps correct the behavior that we do not see other life doing. These structures, systems, and interactions may suggest to us how we can correct certain practices of ours, as nature itself has optimized and produced individuals and communities that are in homeostasis by default.

Biomimicry is a tool in our technological arsenal, for it can help us solve many problems in ways we still can't imagine and it already has served as inspiration for many breakthroughs. We must, however, not allow ourselves to try and fix everything with it, or with technology in general. Biomimicry is a great way to create new products, but we must not forget that they are still made by us, and that serious reflection on the impact that our new products might have is important. For that, we should pose questions such as: is this new product necessary? Is it seeking profits over global well-being? Is it going to be sustainable, biodegradable, and non-toxic?

Biomimicry is also very useful when designing biophilic spaces (Figure 45) , as they both complement each other greatly. Biophilic design is the goal, keeping in mind that biophilic design is a type of design that seeks to include natural and organic elements, usually by using living plants, waterfalls, gardens, or rock patterns in spaces to improve human well-being, suggesting that we have

Figure 44 Biomimicry applied to architecture (Pathak, 2019)

Figure 45 Biophilic environment design
(from: upload.wikimedia.org/wikipedia/commons/9/99/Ohalo_biophilic_learning_space02.jpg)

an instinctual connection to other life forms (Young & Wodehouse, 2018). So, biomimicry is the tool to reach that goal of biophilic design, by using nature itself as a guide to know what to include, how to include and how people will interact with such elements. A good starting point is our evolutionary past, as it reveals to us how we used to live and how close our habits and ways of being are to nature — at least we are still psychologically programmed for such habits, even though we do not act upon them anymore, as psychological evolution takes more time to get used to this new way of living which is only roughly 150 years old. Our diets should be local and seasonal, eating little to no processed food, we should interact with natural elements daily — this doesn't have to be a barrier to functionality and practicality — and living in smaller and more cohesive human communities.

Good examples of biomimicry putten into practice are solar panels — that were inspired by the photosynthesis process of plants — or neuronal networks — that model the behavior of complex neurological systems, namely the mammalian brain (Pathak, 2019; Pushpraj, 2020). It is important to note that we do not have to always follow the principle of biomimicry, as sometimes the living organisms themselves are the most optimal at achieving a task, for example, plants and absorbing CO2. We have already created mechanisms that mimic the behavior of plants in the sense that they capture CO2 from the air and convert it to oxygen. But it seems that plants are the most optimal. Even if we achieve such technology, it still needs to undergo a process of improvement, mass fabrication that is doomed to have its negative impacts as compared to simply planting trees. The usage of the Physarum polycephalum — a type of slime mold — for the optimization of a solution for the traveling salesman problem is also a good example of the principle of functional biomimetics applied to solving real-world problems (Jones & Adamatzky, 2013). Our focus should not be to replace trees or optimize crops and genetically engineered organisms but to encourage the living ones to follow the laws of natural selection and evolution to improve the genetic material and really avoid messing more with the natural processes.

Very closely related to biomimicry – in a way, it encompasses biomimicry – is the concept of biosemiotics. The idea that signs, codes, and meaning are not only used by humans but also animals, plants, bacteria, and many other natural phenomena is a groundbreaking approach to a new philosophy of science. Biosemiotics studies these signs and codes and how they may serve as a method for nature to communicate across species, and hopefully to be able to make use of this semiotic system for signaling and sending meaning to non-humans. The study of biosemiotics speaks for the human will to understand and communicate; to improve language.

There are new ways of thinking about nature, reality, and the universe emerging, which are increasing in abstraction but becoming also more simple and holistic. Systems Thinking is one of those tools. It consists of a perspective, a language, and sets of tools that offer new models and approaches to explaining systems, focusing more on their connections and their whole, as opposed to their parts individually (Capra, 2007; Monat, 2018). Like Gaia's Theory, it is also a holistic perspective. We can note how biomimicry, Systems thinking and fractal fluency theory are ways we can think about patterns in a multidisciplinary way. This is hugely valuable and is being developed by Qualia Institute in San Francisco, which in a way is the mathematical equivalent of visionary art. It attempts to create precise mathematical models to describe subjective experience, map out the full space of possible conscious experiences and build technologies to improve the lives of sentient beings. The way that the Qualia institute connects to this project is not through the visuals nor the artifacts resulting, but in the way, it seeks to use the visionary qualities of the mystical experience in a pragmatic and rational way, as well as by using the patterns and mathematical models to generate interdisciplinary knowledge.

For the application of this concept in the immersive experience, we will make use of mainly non-functional biomimicry. The visual characteristics of natural structures and patterns can be of particular use for new types of communication and environment creation. They can establish feelings of safety and belonging, and are overall appreciated by most humans. (Young & Wodehouse, 2016) Such visuals will help build an environment of deep reflection and a sense of ancient ways of being that were forgotten in recent industrial times, but that have been with us since the very early days of cave-dwelling. By going back to this primordial state where natural patterns, community, and cooperation had deep meaning, the installation brings this sense of union with each other and the earth back into our foreground.

Visionary Art

The term visionary art refers to the practice of giving material and tangible form to the transcendental, the sacred, the subtle, or the mystical, in an attempt to map, explain and interpret these phenomena, archetypes, and themes. It is a form of art that attempts to show that which is beyond sight, in an effort to bring new states of consciousness into reality (Caruana, 2001). The value of this type of art is great, as it helps bring the mystical into the concrete, and spreads the contents of these experiences to viewers without requiring them to go through the experience firsthand. There is great value in experiencing the mystical directly; some may even argue that it is the only way to experience it. But not everyone can or wants to explore their psyche deeply, and for those people, visionary art can be a good way to explore these themes without the risks of psychonautic exploration.

Visionary art is very common in many cultures and times, perhaps because different cultures have explored the mystical and oniric states independently, and registering the findings was crucial to integrate the wisdom (Mikosz, 2015). One could say that the first cave paintings of hands, humans, animals, and basic symbols are the beginning of not just art itself, but also visionary art. It is almost as if all art could be, to a certain extent, visionary. The vision we had then was of recording our story for our descendants; to conceptualize our lives, the hunts, the births, deaths, and rituals into one visual language.

The Shipibo-Conibo people are masters of visionary art. They have developed a language of patterns (Figure 46) inspired by the visions from

Figure 46 Shipibo-Conibo tapestry
(from: upload.wikimedia.org/wikipedia/commons/d/d8/Shipibo-art-4.jpg)

Ayahuasca, an ancient brew with psychedelic properties. The patterns register a sound, more precisely, an Ícaro which is an improvised chant that the shaman sings throughout the ceremonies. This is a synesthetic expression of the sound into the weaving of the tapestries, which is very interesting for the subjects of design and semiotics (Shipibo-Conibo, n.d.).

Figure 47 *Ascent of the Blessed*
(from: en.wikipedia.org/wiki/Ascent_of_the_Blessed#/
media/File:Hieronymus_Bosch_013.jpg)

As mentioned in the Sustainability section, Solarpunk and visionary art have some overlaps. The two movements overlap in the sense that they both are visionary; they both use art as a means to offer visions of potential, to inspire and guide our efforts towards something more holistic, more harmonious, more sustainable and also more sublime, etheric, and sacred. The positive expressions of visionary states are the same in Solarpunk and the broad visionary art genre. They differ only when it comes to the palpability of the art scene: Solarpunk is focused on the material, technological and outer world, and how it can improve; Visionary art is more focused on the sublime, the subtle, the spiritual, and the inner worlds. The utopian perspectives and scenes depicted in both styles are frequently ridiculed and dismissed as naive idealism, but that is completely missing the point and usefulness of these perspectives. They are not necessarily descriptions of our future; they are like a visionary compass towards what we are destined to attempt: to perfection, evolution, progress, and harmony. They serve as mere pointers for us to keep moving forward and not necessarily descriptions of the future.

Although not commonly described as visionary art, the some paintings by Michelangelo (Figure 48), Hieronymus Bosch (Figure 47 and 49) or M.C. Escher (Figure 50). They all are works that express mystical visions: some from "higher" dimensions of love, light, and sacredness, and others of "lower" dimensions full of suffering, viscera, and profane figures. Some are more mundane, others are more ethereal. Some are symbolic, others concrete. There are numerous spectrums of properties occurring in visionary art.

Figure 48 *Adam's Creation*
(from: upload.wikimedia.org/wikipedia/commons/3/30/%27Adam%27s_Creation_Sistine_Chapel_ceiling%27_by_
Michelangelo_JBU33cut.jpg)

During the industrial and scientific revolution, humanity lost touch with this type of art, giving preference to surrealism, abstractionism, dadaism, art deco, pop art, as well as architectural and technical drawing, ending in today's modern computer graphics and 3D art. However, in recent years, and connected to the psychedelic renaissance, visionary art began gaining more attention and has evolved with the times. The themes are less about gods, angels, and religious settings, and more about sacredness and nature. They are more grounded, though of course they still are referring to the very same metaphysical and abstract ideas. Modern visionary art is more focused on

Figure 49 *The Garden of Earthly Delights*
(from: upload.wikimedia.org/wikipedia/commons/b/ba/Garden_delights.jpg)
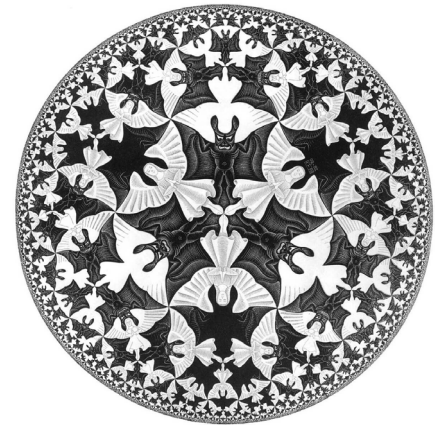
Figure 50 *Circle limit IV (heaven and hell)*
(from: images.squarespace-cdn.com/content/v1
/5a5394dc2278e7ad14ff4832/1529481334515-
LMXE26DY5K2INTQ4J5F6/escher.jpg?format=2500w)

giving glimpses of possibilities than descriptions of myths. Some modern visionary art also employs computer graphics, to achieve complex structures such as fractal flames, 3D scenes, and non-euclidean geometry.

On a side note, entoptic phenomenon, that is commonly experienced in mystical experiences, can include waves, branches, grids, lattices, spirals, honeycombs, tunnels, full-blown 3D environments, or non-eucledean and hyperbolic geometry (Emilsson, 2019; Luke, 2010) is very used in shamanic art, both ancestral and native as well as today's shamanic, psychedelic and visionary art. These archetypal patterns are known as form constants (Luke, 2010).

Some visual artists are developing specific techniques to emulate the subjective visual and auditory effects of psychedelics, in what is called "replications" (Figure 51 and 52). Psychedelic replications are either still images or short videos of a wave of more intense subjective effects, making use of channel separation, wrapping, symmetry, edge sharpen and a myriad of other effects to recreate the flowing, fractal, pattern-like visuals that one sees on entheogens. The sounds are also worked on, with some artists adding sound delay – a common subjective effect of a classical psychedelic when in silence – or adding gliding frequencies and textured sounds and synths.

Figure 51 Psychedelic replication of a fence post
(from: thumbs.gfycat.com/FarawayDistortedIbizanhound-mobile.mp4)

Figure 52 Psychedelic replication of a tree
(from: thumbs.gfycat.com/ThinSafeHorse-mobile.mp4)

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This delay sound effect was added in the track "Shamanic" composed for the experience as if the shaman was guiding the visitor through a wave of psychedelia. Replications can be subtle, intense, and recreate the opened-eye visuals or the closed-eye visuals.

Through visionary art, we can get a sense of what the content of the mystical experience is, and how it relates to us. It helps us talk about our goals as a collective so we can more harmoniously work towards that. One of the most famous visionary artists of today is Alex Grey. Alex is known for his masterful depictions of everyday life while showing the mystical dimension overlapping that event, such as giving birth, embracing or the moment of death (as seen in figure 54). He also has paintings representing the archetypal energy of Jesus or our planet Gaia (shown in Figure 53)
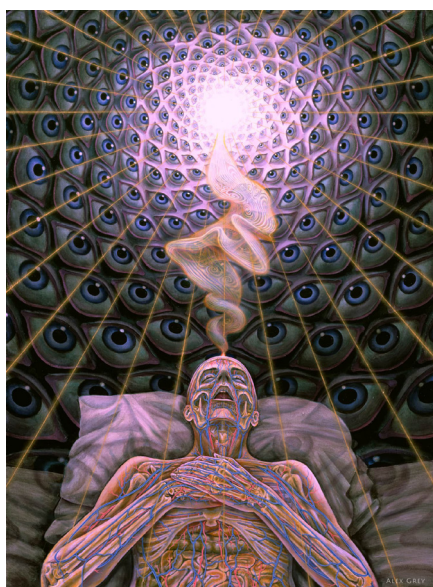
Figure 54 The moment of death by Alex Grey (from: alexgrey.com/art-images/Dying-1990-Alex-Grey-watermarked.jpg)

Figure 53 Representation of Gaia (Earth) and the two roads ahead by Alex Grey (from: alexgrey.com/art-images/Gaia-1989-Alex-Grey-watermarked.jpg)

Escher was reluctant in describing his work as mystical (Ernst, 2021), but was certainly a visionary artist. He may not have vividly seen the dual and non-dual patterns of life or the hyperbolic tessellations or even the outright impossible geometries himself, but he envisioned these psychedelic themes to an extent, and that means visionary work. Unlike Escher, however, the artist Shawn Thornton sees – or used to see – intense visions, symbols, and patterns relating to mystical themes (Figure 55). Eyes, triangles, snakes, pentagrams, and alchemical symbols are very frequent in Shawn's work. Shawn, however, got his visions because he suffered from a cancer in the pineal gland (Johnson, 2014).

Although not really visionary, some works of A.I. have achieved pieces of visionary work, but that is not why they are being brought up, as the current algorithms can create almost anything. The relevant and interesting aspect of image generators is the resemblance they have with psychedelic

Figure 55 Painting of Shawn's visions
(from: images.squarespace-cdn.com/content/v1/51f13e79e4b0799d35dfa1a8/1490820220015-IQZOXBD7WQ85B97F45GS/02_Thornton_
Witch+Doctor+At+The+Eye+of+The+ Solar+Epoch_040910_8F_web.jpg?format=2500w)

closed-eye visuals. Both seem like fragments of ideas and shapes morphing, until they gradually take a more concrete form. This is on par with the mechanisms behind the flowy and impalpable nature of an oniric and mystical state.

In conclusion, visionary art is very relevant to the project because the experience created is in a way visionary. It seeks to embody mystical themes into an art form. Although most visionary art is painted, it does not always have to be so. This means that the work presented here, although highly technological and abstract, can still be called visionary art.

Shamanism

When picking a title for this section, there was some uncertainty between "Shamanism" and "Psychedelism". The former ended up being chosen because it inherently includes the latter, while psychedelism by itself can sometimes be interpreted in a way that is detached from the spiritual and mystical, in an almost purely visual and superficial take. Shamanism provides a deepful, grounded, and systematic approach to psychedelism, perhaps due to the fact that shamans have the most cultural experience with psychedelics of all human groups.

Shamanism is another loaded term, which will be clarified now. The tricky thing about shamanism is that it is a cross-cultural phenomenon, which makes it hard to pin its characteristics. The increase of the so-called "plastic shamans" — people pretending to be shamans — is also a reason why spiritual and shamanic practices may have been so negatively portrayed (Arregi, 2021).

Nonetheless, shamanism can be described as a system of spiritual practices that seeks to induce altered states of consciousness or trances where the shaman allegedly contacts the spirit world. (Winkelman, 1989) It is the oldest spiritual practice that we know of. The shaman uses these journeys and contacts to heal, divinate or guide in service of his or her community. It is a system that has evolved organically, as it is a tradition in constant evolution (Mackinnon, 2016). As mentioned in the previous section, shamanic cultures exhibit the same perspective that seeks to be shared in this experience, regarding understanding the mechanisms of non-duality. The shaman — like the one in Figure 56 — believes that everything is one, and is supposedly able to see past that illusion to access information that a human couldn't otherwise know. Some theoretical physicists have proposed that some of the some of the results achieved by the shaman are related to specific quantum mechanics (Wolf, 2005; Dennis, 2010). Given the amount of disagreement among the most intelligent physicists regarding quantum mechanics, and given the results shamanism has been showing in healing potential, it is a fair topic to research further.

It would seem then that a shaman has developed a technique to access the "spirit world", represented in Figure 57. But what is this? Spirits to some seem like actual autonomous entities, while others dismiss them as projections and internal phenomena manifested and/or hallucinatory phenomena. It is also possible that they are both. When we describe our friends and family as real people, we are doing so only because other humans confirm what the consensual reality is and that those people are there and are "real". Our internal model of reality is still hallucinatory in essence, meaning neither is an actual reality and both are just perceptions. Nonetheless, this can lead to a form of solipsism, where no consciousness but ours is real; a dangerous but deep and fruitful thought experiment. The idea of spirits could also very well be an anthropomorphization of information that is only accessible in mystical states; a way to cope with and explain

Figure 56 Shipibo shaman (Rittner, 2007)

Figure 57 Depiction of a shaman healing a person
(from: pbs.twimg.com/media/EpdnXstXUAEPc1N.jpg)

the "impossible" revelations and visions. The truth is we will likely never know the answer. In fact, we can not even prove that visions of our parents, children, brothers, and friends are any more real than visions of gods, angels, or demons. It is best to practice caution in regard to these claims while keeping an open mind.

Nonetheless, shamanic methods have been teaching many things to the Western world. For example, shamanic music and sounds (Winn et al., 1989) or ceremonies with entheogenic plants, fungi, and cacti (Winkelman, 1989) have brought into the West new technologies and ways of approaching healing. And the fact that shamanism is a cross-cultural, timeless phenomenon reminds us of the concept of perennial wisdom, and how such practices could be about something more objective than it seems at first glance. The truth is that uncontacted tribes and cultures have a form of shamanism developed in some way or another and their practices adopt similar techniques and symbols (Winkelman, 1989).

The very animistic approach is a useful one, and one which has manifested itself in different forms, one of which happens to be scientific, that is Gaia's theory. The idea that something other than animals has some sort of rudimentary conscience or aliveness is useful because it recognizes the importance of those entities and natural phenomena. To say that plants may have some form of intent or intelligence is a controversial statement but it isn't necessarily false (Pollan, 2013); we may be limiting the concept of intention to those beings which are most similar to us, and leaving the rest as mere entities guided by machine-like, reaction-based systems. We must not forget that we are ourselves guided by the same logic of being made out of machine-like systems if one tends to embrace reductionism. Intentionality is not by far a human-only trait and we will be finding that more things have intentionality than we previously thought. Plants cooperating with mycorrhizal fungi, or plants enveloping their seeds in sugary meat to attract animals are a great example of this intentionality, which can be brushed off as mere evolutionary symbiosis but yet is evidence of the will of different species to communicate and help each other. At the very least, panpsychism — the idea that consciousness is present in everything — is being taken more seriously by scientists (Rozsa, 2021).

The panpsychist perspective describes how consciousness is rudimentary in minerals, like rocks or water but becomes stronger and more structured in bigger and more complex structures, like living organisms. Organisms such as cells, bacteria and fungi may have a rudimentary perception, superior to that of rocks. The organs composed of the cells have their own perception, more complex than a cell, but simpler still than an animal's. Animals and plants have more complex structures, composed of different organs and cells, creating highly complex subjective experiences with different sensorial inputs and inner processes (Rozsa, 2021). The whole planet or the whole universe can be, according to the panpsychist idea, having a conscious experience, as if a highly complex brain that we simply have too simple brains to understand (for in truth, this planetary or cosmic brain is composed of the brains of all humans and many other systems, entities, and

connections).

In a letter to the President of the USA, Chief Seattle from the Suquamish tribe wrote about the animistic and sacred perspectives their people have and gave a helpful perspective on how we can treat earth and each other (Letter from Chief Seattle to President Pierce, 1885, n.d.). This speaks for the indigenous and shamanic perspectives, and how they can be sometimes more mature than the modern and Western ones. There is much to learn if we are humble enough.

In conclusion, shamanism was a source of great inspiration for the construction of the experience. In a way, it is a cultural evidence of the possibility of the connection and communication across different natural elements and the will of two entities to exchange information and understand each other; a form of biosemiotics put into practical use. This is precisely the type of attitude of cooperation and respect for nature that the experience seeks to induce, using similar means. Shamanism also has its own visual and musical traits, even across different cultures, which were used as inspiration for the development of the experience and the space the installation is set up, along with visionary art, which in a way is sometimes shamanic or incorporates shamanic themes. The shamanic patterns, symbols and rituals have influenced things from the style of the visuals, the musical compositions, and the space layout.

Conclusion

The shift in perspective that the planet is going through is big. Sustainability, holism, human rights or animal rights are beginning to become normal concepts in the collective consciousness as we walk towards that utopia of the full human potential – while remembering that perfection is not a place or goal, it is a process. We still have much work ahead and will have to delve head first into the topics of love, connection, apathy, fear, sickness and death; connect on deeper levels and reach better understanding; we will have to ask the right questions such as what things are sustainable, sacred or good for the planet as a total organism. Each human will be able to help us, the whole humanity, for only they can fulfill their role in this play. Everyone is important and we can help each other flourish through the practices and contemplations that are suggested in this conceptual basis.

That will – as shamanism suggests – require us to re-think certain things such as how we culturally view Gaia (as a planet? a system? an entity? a God? something else?) or how we perceive the use of drugs: in the west, alcohol, and tobacco are perfectly acceptable, even though they are very harmful substances, all while a psilocybe mushroom is not just frowned upon, but also criminalized, despite having no deathly dose and being non-addictive. This is a contradiction and a great example of fear of the unknown taking us away from valuable tools at our disposal. We will have to rethink how we view technology, using endogenous techniques of healing such as breathwork, tai-chi, and diet over pharmacological ones – as to avoid their side effects or the tolerance to antibiotics.

As a civilization, we will have to strive to hear more, speak about unity, ignore divisive propaganda by governments and corporations, and rekindle the warm and connected reunions of old in our daily lives. We are not cogs in a machine, we are cells in an organism. We still have our planetary, social and individual responsibilities, but we also have a life to enjoy.

The holistic perspectives that touch themes of an universal consciousness seek to reinforce our sameness. The shamans know this, the Buddhists, Hindus, and Sufis as well. We are – according to them – detached identities of the same fundamental entity, playing with the separation and the limitation. This is related to the Sanskrit greeting "Namaste", which translates to "I honor in you the same light that shines in me". Or the term "Ubuntu", a word that comes from an African saying, meaning: "I am because we are". Both greetings are an example of the recognition of this very interdependence and interconnectedness.

Non-duality, Gaia's theory, sustainability, biomimicry, and shamanism are all concepts and practices that in a way recognize that all living systems are interconnected and have a profound impact on one another and the larger ecosystem in which they exist. Non-duality along with shamanism insist on the existence of a dimension where separation is seen as clearly

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illusory; hence they recognize the interdependence and interconnectedness of all things. Gaia's Theory also recognizes that but does not focus on the subjective experience of connectedness but a model to explain that connection. Sustainability also agrees with those ideas, being more focused on developing methods and practices to align ourselves with those truths. Biomimicry stands right at the edge, being less about this connection and interdependence and more about enjoying it, by building solutions for humans and nature using natural frameworks as inspiration and guides.

They also suggest that by studying and emulating the ways in which nature functions be it scientifically such as with biomimicry or spiritually as with shamanism, we can develop more sustainable and harmonious ways of living on the planet. We can have better stances as humans, and we do not need to give up our comforts, we just need to find better, simpler, sustainable, and holistic solutions. To conclude, the conceptual basis section establishes the philosophy behind the project as well as the visuals associated with each concept and will hopefully clarify the choices made during the development of the installation.

5.3 The message

So with the problem exposed and with a groundwork of the relevant key concepts covered, what is the message being attempted here? Well, the core ideas behind this project are:

- Reinforcing our sense of connection to nature;
- Existence and implications of non-dual states of awareness;
- Pattern / fractal thinking as a new way to think about reality;
- Encouraging presence, acceptance, gratitude, and community;

All of which pretend to help heal our "disconnection" from eachother, nature or the universe.

So, the message points mostly to subjective phenomena. This is not by mistake, as the subjective experience of individuals has been greatly downplayed but remains the most important aspect of reality: because this is the only place where suffering exists, and it is all that we will ever experience. Science in essence also seeks to help human individuals, so their subjective experience is key to improving lives and people's knowledge of the universe.

It is also important to note that subjective experience is a subset of the ultimate reality we strive to understand, so to reduce it and dismiss it is to throw good information out of the window. We must embrace it and try to understand it. Understanding ourselves but also the minds of others. This, in essence, is what the phenomenological approach defends.

As it is taught in Taoist traditions, *"The Tao that can be named is not the eternal Tao".* In other words, the reality that can be talked about is not the true reality, because, as Alan Watts puts it: *"What is reality? Obviously no one can say because it isn't words. It isn't material, that's just an idea".* Because words alone can not do it justice, we must make use of metaphors, symbolism, attitude, images, sound and other synthetic forms of expression to help point to it, which is roughly what humans have done when they want to describe or understand "reality". Pointers are all we can do, at least with the current linguistic and technological tools we possess. As George Box puts it, *"All models are wrong, but some models are useful".* We now face barriers to progress not from the scientific or technological front, but from the linguistic one. The different languages and cultural lens are likely the main reason we still have not reached consensus relating things like what dark matter is or the mechanisms of quantum physics. Language has its limits, and we must recognize that in order to improve our linguistic tools and ways of communicating.

Therefore, this project can not be taken just by the words mentioned on this document, but also the resulting artifacts as well as the symbolic and metaphorical expressions, the analogies being drawn. And this alone can or can not be enough to trigger an epiphany. That should not stop us from

trying to express it in our own way, as it may be the easiest medium to convey the message for some while to others it is even more confusing. The project is a mere pointer to the transcendental dimension.

The sense of ego-dissolution is a multidimensional phenomenon and can have different qualities and interpretations (Millière et al., 2018). The value of feeling directly connected to nature is huge. It forces us to feel what the earth "feels", and although it can be painful, it is needed so we can correct collective actions. A person who numbs themselves from their pains will not be able to fix the underlying issue, just like a humanity who numbs itself can not fix its underlying problems.

The ideas presented here suggest that we seek out a more loose and fluid approach and that we include spirituality in our scientific paradigm. Some serious scientists who are working on bridging the scientific world with the "spiritual" one include Paul Stamets, Robin Carhart-Harris, Roland Griffiths, Rick Strassman, Fritjof Capra, Nassim Haramein, Robert Grant and James Cooke, and any of them are highly recommended for anyone skeptic of these "spiritual" dimensions of human consciousness. There is untapped potential in using spirituality as a means to orient people towards nature (Ives et al., 2018). Nonetheless, there is great potential for the scientific community to explore deeper aspects of human nature such as spirituality.

"Furthermore, their spiritual practices can be powerful in shaping the deep values and beliefs people hold. Contemplative practices, such as mindfulness, even outside of a religious context are indeed powerful levers that have been found to relate to psychological nature connectedness and can help promote sustainability" (Ives, et al., 2018, p. 5)

So, as the second point at the beginning of this section suggests, the message points to a subjective experience of unity, the previously mentioned states of NDA. A temporary altered state of consciousness that is often associated with feelings of sacredness, love, and extreme vividness (Cosimano, 2020; Luke, 2010). Is it objectively real? That is a question scientists and philosophers are still dabbling with. However, the truth of the matter is that anyone who has experienced it was left deeply impacted by it, usually in a positive, uplifting way. The easing of suffering is absolutely real, as we can measure this qualitatively; however, some attempts to disprove/understand objective reality takes this magical experience and places it in the realm of fiction and delusion, taking the value out of it and even some of the results, as doubt creeps into the mind of the subject and undermines the main mechanism of the placebo effect. Regarding the NDAs, the supporting evidence formulates that the reduction in activity in the Default Mode Network – the part of the brain which is responsible for the ego and the sense of self – is the mechanism behind these mystical experiences (Carhart-Harris & Friston, 2010). The experiences are triggered by a cessation of the thinking mind. They are that which we experience once we let go of the duality of things. No more true or false, in or out, living or dead, painful or pleasurable. There are no longer absolutes nor concepts. The

intensity, significance, types of visions, and sensations that arise during an experience of ego dissolution depends greatly on the psychological state of the individual, along with intention and environment where the experience is taking place. The research done by Johns Hopkins University explores the benefits and safety measures around consciousness exploration using psilocybin and it can be found here: https://hopkinspsychedelic.org/

"This division is, of course, useful to cope with our everyday environment, but it is not a fundamental feature of reality." (Capra, 1975, p. 45)

The NDA and its existence is a key message of this project. The goal with this project is that more people become aware that these experiences exist, and also that more people talk about them and their implications. The very ambiance of the installation is an attempt to recreate the NDA, by blurring the boundaries between the inner world and the outer world. This relates to the idea of nature connectedness that is at the core of the projects. The idea that we must directly experience nature to be able to care for the earth and its ecosystems. (Fletcher, 2017)

Regarding pattern / fractal thinking, it is important to mention that our brains are, in essence, pattern recognition machines. Pattern thinking is our modus operandi; yet, recognizing such fact, allows one to more consciously note patterns and repetition. By thinking in patterns, one also seeks to bridge different concepts by their repeating features. For example, identifying the pattern of duality in different phenomena: the sexes, life, and death, past, and future, pleasure, and pain, day and night, etc... By noting these iterated phenomena, one can more accurately create a model of reality. One thing that may cause some confusion is that the message of the project is self-referencing as it points to language and patterns using language and patterns. Fractal thinking is also a potentially useful form of thinking, where the conceptualization of certain or even all things follows a fractal structure, which is very similar to the idea of system thinking . It is believed that we have such subconscious affinity with fractals due to the structure of our neural impulses in our neural networks, which forms a branch-like path of discharges, or also because of our co-evolution with trees and plants, which exhibit these structures (Nuhfer, 2007; Reaves, 2016; Taylor & Spehar, 2016).

In my view, the practical applications of the ideas presented here boil down to presence, acceptance, gratitude, and community. The presence in the here and now which although painful at times gives us a more clear view of ourselves and our place in the world; Acceptance, akin to the concept of non-attachment, as one accepts the impermanent nature of reality, of time, disease and death as a way to live more fully (Kochmer, n.d. a); Honest expressions of gratitude for their power to change our perception of reality into a productive and constructive one (Wood et al., 2010) and where even through the difficult times we notice that beauty still lives on; Community, for we are all interconnected and One, meaning love and cooperation are probably the most important traits to cultivate (Schwartzberg, 2019) . Evolution itself seems to reward mutual benefit, which would mean

encouraging community is key, but not just a community based on niche and specific commonalities, but a community built on archetypal and universal values, like being alive or living on the same planet; A planetary community.

A message of non-duality is, in my view, a message of love and understanding, for if everything is one, any hate or harm is self-hate and self-harm. The duality and the ego also serve to generate experiences that have their value, meaning that the optimization of such experiences is key. That is achieved through the concepts mentioned in the last point, where the individual seeks to reinforce the good rather than fight the bad, by expressing honest gratitude or by practicing acceptance or non-attachment. So through the patterns and fractal archetypes that reign over our whole being and cosmos, the message of unity is conveyed. The core message of this whole project is easily broken down into two single words: peace and love.

5.4 Delivering the message

The message to be delivered could be reduced to the bullet points presented in the previous section. The core method of delivering the message was mostly through biomimicry and symbology. The concept of biomimicry was a form of inspiration for the development of the visuals and the sound. But it was also a form of presenting the value of the concept itself, in a self-reference. It also helped encode the conceptual aspect of the installation into a morphological domain, by capturing the very natural and organic structures and patterns into appealing visuals and textured soundscapes.

The symbolic dimension of the installation is perhaps the most important. A symbol is, afterall, a message being transmitted through an archetype, usually in the form of a visual shape or title/word. So the use of symbology was done in a careful way, as it is understood how divisive and polarizing symbols can be. The symbology of the installation can be found in the very order of the physical stages, and in the biosemiotics of the natural structures and designs. The patterns of nature (which were outlined in the State of the Art section of this document) and the field of biosemiotics are themselves an example of how signs are not just a human language, and how we can learn a great deal by observing nature's patterns from a holistic point of view. They do not symbolize human constructs, hence why we have a harder time decoding them. Natural patterns are the harmonious distribution of an organism, mineral, or energy shape in space. They form toroids, sine waves, hexagons, and many other shapes that have proportions which approximate mathematical constants and functions; and in these structures we have found much useful information about reality.

So, to deliver the message, and with such a focus on nature and spirituality, the layout was designed to invite the visitor into the present moment by presenting them with an interactive system. The visitor is then led through a series of sensorial experiences that will make reference to the mystical dimensions of human consciousness, of natural patterns and imagery of subtle psychedelic inspiration and, of natural sounds and sacred harmonies, and references of ancient human rituals of cooperation, love, and community around the fire.

The delivery of the message is done through artistic expression. It is not the clearest way to transmit the information (this document is the ideal form of achieving that) but it is the most emotionally impactful one, which is an effective way to bring about systemic change (Ives, et al., 2018). Even in the people who do not get the message, the seeds are planted, and they may eventually grasp or start to investigate more about the topics. This immersive experience will attempt to take the visitor through a metaphorical ego dissolution. The environment is calm and meditative, and the visitors are invited into being still in order to truly grasp the message. To achieve that metaphor, the use of patterns that can be found inside our bodies but also outside will be used, in order to suggest an underlying mechanism or force that encompasses everything, us included.

This invokes the subjective quality of those reported states of unity and interconnectedness found in NDAs.

The act of meditation itself is something that seeks to be encouraged, and one that focuses on using breathing as a tool for mental and physical well-being. In a Taoist context, the practice has some sitting meditations where the focus is placed on the Qi or Chi which is translated as "life force" or "breath" (Bao, 2020). Curiously, the Hindus have the same concept of breath as the source of vitality which they call Prana (Manasa et al., 2020). The very word "spirituality" comes from the Latin "spiritae" which means "to breathe" (Origin and Meaning of Spiritual, 2018). Our breath is fundamental for survival, of course, but also for the overall feeling of well-being. A blocked and shallow respiration is going to give us either discomfort or actual mental and physical health problems after some time. Meditation is one tool to master one's breath, and as consequence, one's well-being (Breathing Exercises Abdominal Breathing Technique, n.d.; Edwards, 2012).

There was some deliberation as to how to materialize the message delivery stated above, and different sections and key spaces were added and removed throughout the process. In the end, the key vehicles of meaning delivery were decided to be a series of animated visuals pertaining to biomorphological themes as a centerpiece, followed by an interactive space for building community. The conceptual bridge is done because the visitors will be exposed to a bonding setting after the more abstract and mystical central piece, hinting at what could be some of the key takeaways from an experience of non-duality.

5.5 Construction of an environment

The development of the installation went through exploratory and abstract ideas in rapid succession. This was a long, but fruitful period, where little progress seemed to have been made, but in the back different components, visuals, objects, and interactivity were being considered. This included indoor spaces with cubic walls, or in a 360º dome. It also included ideas about more linear narratives, like a contrast between harmony and disharmony or connectedness and disconnectedness; this was discarded, as it was not the goal of this experience to cause conflict or mixed signals.

The message has to be gentle, more passive, and resorting to harmony with the flow of things, much in line with the concept of Wu-Wei in Taoism (Kochmer, n.d. b). It must also be balanced and grounding, invoking the principle of the Taijitu. The Taijitu is generally known as the Yin-Yang, although that is erroneous. The Yin and Yang are the words used to describe the black and the white elements of the symbol respectively, but the symbol in its whole is called the Taijitu (Figure 58) .
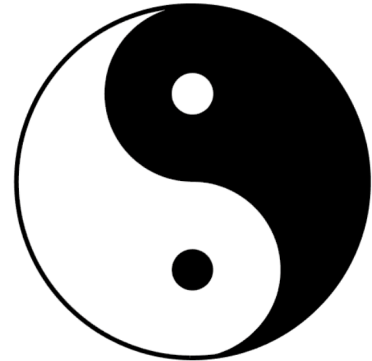
To plan the artifacts which had to be made for the installation, the first thing to consider was the message and method of delivering it, which has been already covered. This allowed for a clearer idea of a potential narrative translated into an environment. The first thing that was done was the development of the visuals and audio tracks. As this was being done the space to install the project was being studied and a series of pictures was taken. Environment-wise, the installation had to embody a natural tone, as if nature itself spoke through it. This was done by designing the space as organically as possible, both in terms of the trajectories and disposition of the elements, but also in terms of the aesthetics and sound ambiance.

An overall sense of cohesion and trajectory was a priority as it is a fundamental aspect of the environment design (Benford & Giannachi, 2011). Imagining the state of the visitor before and after the experience helped define the characteristics of the spaces. More about the visitor's trajectory will be covered in the section Installation planning. This reflection and the gradual process led to the experience being structured into four main areas which will be mentioned throughout the document as:

- Breathing Exercise
- Symbolic Humanity
- Morphogenetic Nature
- Human Community

Breathing Exercise: The first one to be defined was the breathing exercise, which so happens to be the first section visitors are faced with. The goal of this space is to create a division between whatever the visitor had going on before and the rest of the experience; it is a waiting room. This phase will consist of a TD system that is reactive and that seeks to relax the visitor and induce a state of presence which will help open the visitors up to the message of the rest of the installation. Not

Figure 58 The Taijitu

only that, but the meditation it triggers – whether the visitor understands that to be meditation or not – is one of the well-being practices that the experience seeks to kindle. It reacts to the visitor's movement, as to encourage stillness: if there is movement the visuals cease, and a static noise is played. When there is stillness, the visuals flower and begin emerging. The system is also programmed to cycle through a list of tracks which are titled: "Mystical", "Grounding" and "Om".

For the initial phase, a meditation labyrinth was planned, in which a simple design is built with rocks or sticks. These types of labyrinths are solely markings on the ground and not actual walls, and are common in temples, universities, and other public spaces (Figure 59), and are used as a contemplative tool, where one seeks the metaphorical path into their own center as they move through the labyrinth (James, 2021). The labyrinth was not included in the tests of the installation, because the breathing exercise already pretends to induce the state of presence and contemplation while making use of interactive systems for increased immersiveness.

Figure 59 Meditation labyrinth
(from: flickr.com/photos/wallyg/3970862974)

Symbolic Humanity: The second space was composed of the banner of symbols. In short, the banners were hieroglyphic designs with symbols, patterns and geometries. It was a reference to the entoptic phenomenon associated with altered states of consciousness, as well as that which is behind the symbols; the perennial wisdom. The banners attempted to blur the differences between a human symbol and a natural symbol; for example: the Taijitu, hexagon or pentagon. The Yin and Yang are human symbols, but the day and night are not, although the Yin-Yang is symbolizing the exact same principle. Or the hexagon, the geometry behind the Star of David, but also the geometry at the core of most molecules, such as carbon or serotonin, ended up being used in our notation of molecular structures. Another banner included phrases related to sacredness and nature in various languages of human culture, from Sanskrit, all the way to Latin, and binary code. The idea was to erase mental barriers through a universalist perspective where we see beyond the limits of language and symbols, into a more archetypal world.

In the same area of the banners, hanging mobiles pertaining to nature and natural patterns and designs were developed. These ended up being used in the installation, and they have the goal of being elements on the reality side virtuality continuum (Benford & Giannachi, 2011). This means that they function as an aspect of the installation that is manifested on a more physical dimension, alongside the natural elements inherent to the space, such as trees, plants, rocks, and animals. The visual quality of the artifacts could be illustrated with the idea of baby mobiles or dreamcatchers, although these only served as inspiration.

Morphogenetic Nature: The third space established was a cinematic experience, that is high-definition, fluid, and with a deep and emotional soundtrack. It is the main method for communicating the message and is therefore the most central and obvious. The goal of this space, in conjunction with the previous one, is to induce a state of conceptual hyper-connectivity in the visitor, to encourage abstract thinking and joining of the dots. By having many different but carefully placed patterns, visuals and symbols the visitor will be guided to think conceptually in alignment with these themes. This TD system is reactive, but not interactive; it reacts to the music being played. The music itself is cycling between

the tracks: "Peace", "Pan", "Om" and "Shamanic". It is important to stress that the visuals and the tracks play asynchronously, making use of randomness to create contrast, dynamics and avoid repetition. The system in *Morphogenetic Nature* randomly selects the next video from a list of 21 video clips with roughly 1 minute each. The videos were also made in TD but exported as to get more control regarding the animation timing, speed, and fluidity and also to save on the system resources usage.

Human Community: Last but not least is the *Human Community* space. This area consists of a cozy firepit which depending on the space can include sitting cushions, instruments, food, and other things allusive to tribal gatherings. The space is composed of a TD system that takes a microphone as input, and that – similarly to the first space – triggers visuals when there is sound, inviting for sound, storytelling, singing, and music. This emphasizes the importance of community and serves to provide visitors with opportunities for relaxed and informal interactions.

The installation was idealized to be assembled in the gardens of the student's residency (see Figure 60). This helped establish the main constraints and opportunities from using nature as the setting. This led to considerations about weather conditions, dangerous animals or plants, or areas of difficult access. It has also the goal of giving an idea of how the distancing and positioning of the areas should be done, as well as to highlight the cable management required to assemble an installation of this size.

These four key spaces are flexible in their position, but the distance should be considerable as to avoid sound or spoilers from the next spaces to affect the presence and relaxation that each space seeks to trigger. The *Human Community* can be closer to *Morphogenetic Nature*, as long as the sound from the prior does not enter the microphone in the latter.
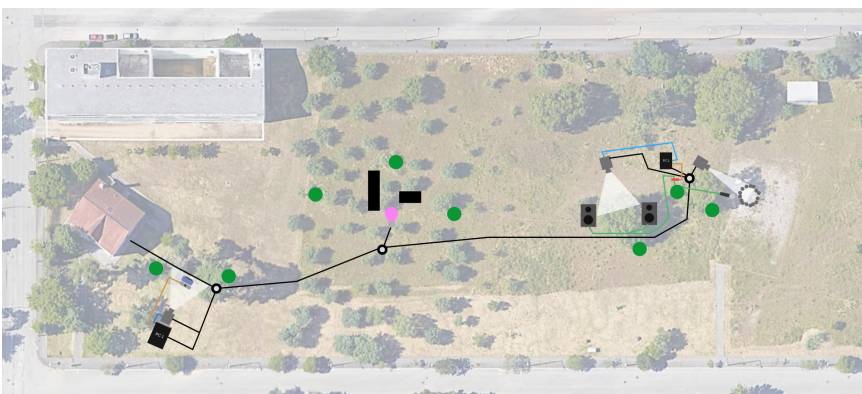
Figure 60 Overview of the spaces and cable connections

The canonical trajectory starts in *Breathing Exercise*, where the visitor interacts with the system, following the instructions. When they feel content, they move on, encountering *Symbolic Humanity*. The visitor then inspects the banners closely or the mobiles hanging along the way. Moving along, they will reach *Morphogenetic Nature* where they will sit down to appreciate the different visuals

and songs. Then they will notice the *Human Community* and hopefully sit with a stranger or with friends, talking or singing.

The participant trajectory diverges firstly in the time dimension, as some participants stay for a complete mindfulness exercise while others feel discomfort in sitting with their own thoughts. Then it diverges the most around *Symbolic Humanity*, because of the open space and lack of centrality of the trees in this area. Exploration is expected here. In the end, most will arrive first at *Morphogenetic Nature*, but a few may also encounter *Human Community* first; the order of arrival is not crucial, as both areas should create a bigger area of humans and nature coexisting.

As for the objects to develop were of four main domains: video, sound, print, and environment design. The actual artifacts that were planned and subsequently developed are defined in Figure 61 according to their parent space.

| Visual | Print |
| Sound | Environment |

Space	Objects to develop
Breathing Exercise	■ A video projection of an expanding and contracting blob as a guide for breathing pace, which is reactive through a webcam feed ■ Meditative music to induce relaxation and contemplation and auditory feedback from the sensor ■ Comfortable sitting area
Symbolic Humanity	■ UV reactive banners x2 ■ UV light ■ Hanging mobiles
Morphogenetic Nature	■ Video projection of a series of 21 clips of emergent, organic and fluid visuals, with ≈1 minute each ■ Calm and textured soundscapes ■ Comfortable sitting area
Human Community	■ Sound-reactive video projection resembling fire ■ Comfortable sitting area

Figure 61 Elements associated with their parent space

6. Development of
the Installation

6.1 Introduction

During the initial phases of conceptual development, the core problem was established, which was the perceived disconnectedness from nature. This shaped the concepts outlined in the section Conceptual basis in the previous chapter and aimed to orient anything that was not related to be dropped from the list of priorities. The most important things to do at the very start of the development were:

- learn TouchDesigner in depth: visual techniques and interactive system building
- develop and refine a visual language
- develop and refine a sound style

In this section, the primary prototypes and the core development of the installation are documented. It will cover the research done about interactive new media installations, the field research, key changes intended to be triggered in visitors and how, the exploration of the trajectories, time dimension, and interaction design. It will then go on to the technicalities and explain the software process that allowed the installation to be reactive and interactive.

At the end, a guide for the assemblage of the installation is presented. This serves as a documentation of the process, but also as a set of guidelines for the accurate reproduction of the installation in different spaces.

For clarity, the table in Figure 62 outlines the names of each area. Space is the parent area outlined before, PC is referring to one of the two computers used, System refers to a TD project running on the respective computer and components list the peripherals in use.

Space	System	PC	Components
Breathing exercise	A	1	Projector 1 Sound system 1 Sensor - Kinect
Symbolic nature	–	–	UV Light
Morphogenetic nature	B	2	Projector 2 Sound system 2
Human community	C		Projector 3 Microphone

Figure 62 Table with the four spaces and respective system letter, PC and components used

Throughout the process of creating the visuals Blender 3 and Processing 4 were used to explore their capabilities of creating emergent visuals; still, most of the visuals were done with TouchDesigner (TD) 2021. The idea of using TD to develop the installation was born very early on in the process; it was in fact decided before the submission of the proposal, and this led to an in-depth, auto-didactic journey of learning the software in depth. From very early the software showed great promise not just to develop generative visuals, but also to manage the installation and build real-time interactive systems and this was heavily explored in the project.

6.2 Installation planning

The process began as a conceptual exploration, and the pragmatic approach consisted of a translation from conceptual ideas into artifacts, areas, and experiences. Defining a physical space was key, as it allows for concrete planning according to the restrictions. For that, a series of places were considered: a large empty room, a planetarium with a 360 dome, a garden, or a forest. Given the theme of the project, it made sense to impose a requirement, which is that the installation shall be placed outdoors, in a mostly natural setting. In the end, the space chosen was the public lawn in front of the students' residential building in Polo II, of the University of Coimbra. The two tests, however, were conducted in the gardens of the department of informatics engineering and a garden of a private house in Sintra. This was because the space that was initially chosen was big, with no power sources nearby. With the space defined, specific sub-spaces and artifacts were more easily established. In each testing session, a preliminary study of the conditions of the ground, vegetation, hazards, and advantageous aspects was conducted. Such study helped define the main areas described in the section Construction of an environment on the chapter Conceptual development. The fact that the installation was being planned on one space and the tests were done on another was a challenge but helped solidify the installation structure, the assembly process, and helped make it flexible and modular. By the end of the second testing session, the process of installing the artifacts and the layout was already intuitive and flexible, even if the space changes.

The iterative process of developing the visuals and the audio started with a layout of the whole space, divided into sub-spaces, and a categorization of the key components for each sub-space. Certain components were declared indispensable from the very start. Namely, that the installation would cover the two major senses of the human body: vision and hearing; and also that the installation should convey a linear narrative in space, and a non-linear narrative in time; that is, the positioning of the projections, sensors, and speakers create spaces which create a linear narrative, and the projections themselves and sound would explore non-linearity by using the dimension of time. The dynamics between linearity and nonlinearity allowed for an organic expression of a message, with a beginning, a middle, and an end. The visuals would have to work together, and they would have to reach a level of refinement and style that was satisfactory to properly convey the message. The visuals were also planned to be generative and emergent, both because generative visuals is one of the most powerful advantages of using TouchDesigner (TD), but also because generative and emergent programming techniques are the easiest to achieve organic looking, helping achieve a natural, bio-morphological visual language.

Interactivity, or in the very least palpability was also deemed indispensable, as the physicality of the experience would help integrate the message better. By bringing touch, smell, or some sort of feedback or interaction the message is brought more strongly to the material world and into consensual perception. This means that besides the projections and the sound, the space itself had to be pointing to the same morphological and fractal ideas, which was achieved by placing the installation in a natural setting, preferably with trees, plants, and rocks. To add

to this dimension, hanging mobiles made from pinecones, sticks, feathers, and branches were added to the plan of artifacts to develop. These offer a close object which exhibits natural fractal patterns, to reinforce the key message, while adding a tri-dimensional, textured layer to the installation.

In the early phases, different layouts were considered: more spaces, less spaces, reordering of the spaces planned and slight changes in the goal and characteristics of a given space were all part of the process. In early prototypes in Figma the following ideas were in place: The planning of the installation then sought to consolidate those conceived spaces and generate the artifacts according to the specifications of each space. This is expanded in the following sections, where the technicalities and actual installations are documented.

The visitor's trajectory and interaction potentiation was also focused on, and the idea was to mix a linear space narrative, with a non-linear, looping narrative. The space has a linear sequence but each area is not linear: the visitor can enter any area at any time and should still perceive a sense of cohesion without feeling like they missed anything. The following diagram (Figure 63) illustrates how the visitors' subjective experience flow as they move through the installation.
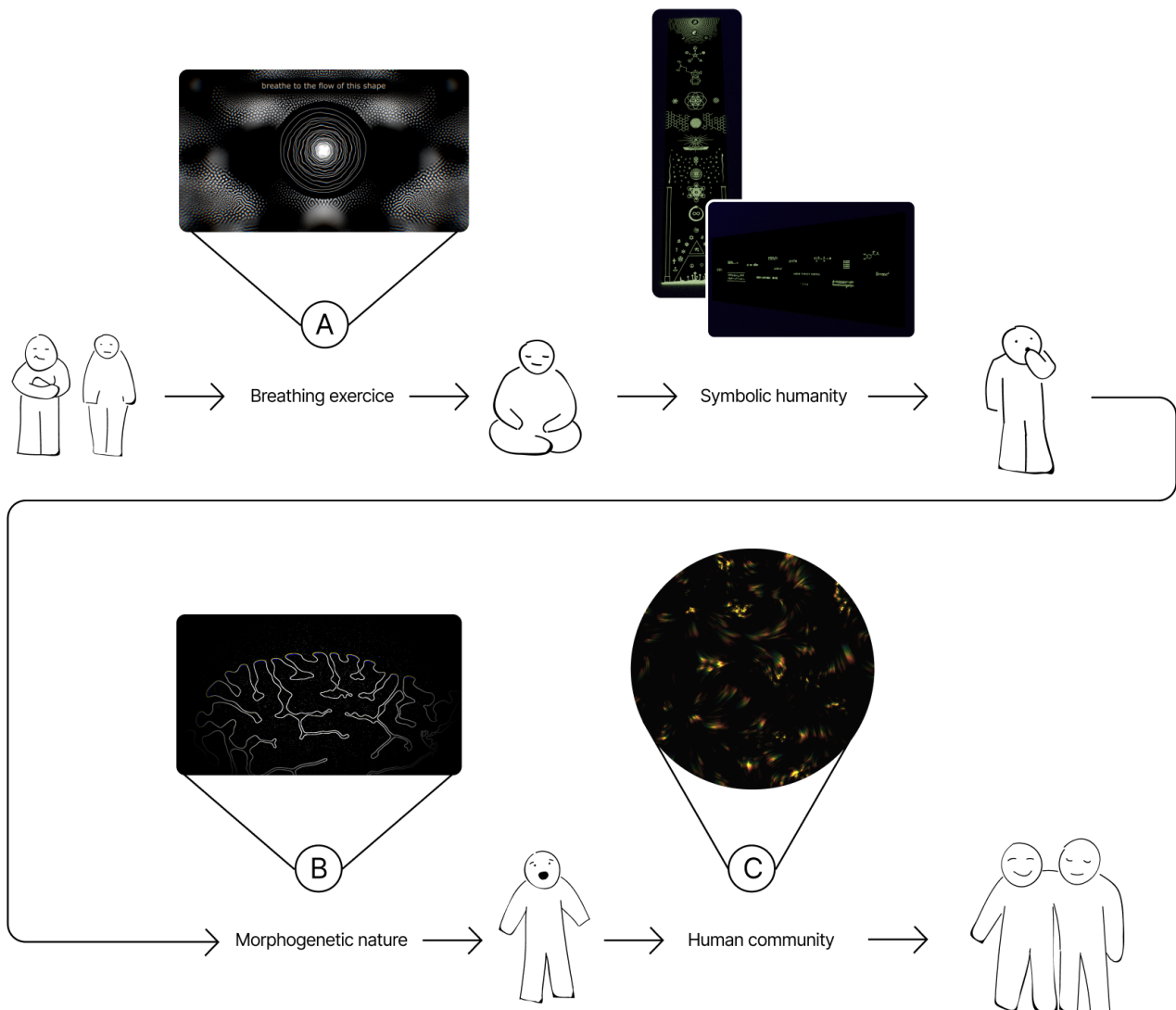

Figure 63 Visitors' expected reactions

The visitors are expected to enter the installation with different emotional states and with different intensities, and therefore that adds unpredictability and variability to the study, as well as less focus by the person; they may be anxious, tense, curious, excited, calm, angry, etc. This was minimized on the experience by the implementation of a brief, relaxed mindfulness exercise, which aimed to bring the visitors into the here and now; into a more stable baseline on which the experience can unfold.

From the entry point, and connecting to practices of meditation, the visitors are invited to sit and breathe in order to ground themselves. Technically, it was achieved by implementing an expanding and contracting blob to guide the breathing, along with textual guidelines. The interaction in this area is more like a visual and auditory feedback of movement. It will likely go unnoticed by most people, but subconsciously an association between movement and uncomfortable noise may be created.

After this, the visitors will slowly get up from their seats and walk to the glowing banners and connect to artwork of human symbols across cultures and time. This is expected to cause a subtle shock and will not serve to be interpreted, as much as it serves to be a subconscious suggestion for a pattern-finding and appreciating mindset to the visitor. The various symbols are intended to suggest holism, ecumenicism, and humanity by presenting different symbols such as technological, religious-spiritual, and linguistic characters. At this point, the visitor should be relaxed from the initial pause but puzzled by the artwork.

From there the visitor will be drawn to the sound and bright projection that is central in the space. This will have seats available as well, for the visitors to calmly take in different auditory and visuals. Because they are both in a loop that combines specific visuals and specific sounds to make a new combination, it adds to the sense of newness, even after a certain time. This is where most of the message is encoded, in the cycles, the waves, the creation and destruction, and the growth and expansion. The visitors are expected to feel relaxed from sitting, now without having to follow a specific exercise, and will become easily more immersed. The different symbols of human history and cultures, placed alongside the different symbols of nature's history and different expressions will attempt to induce a state of great pattern thinking in the visitor and encourage dots to be joined, not just related to the issues of sustainability, connectedness or holism, but also topics going on with the visitor's life.

While sitting and contemplating the different natural structures, designs, and fluxes, the visitors will gradually take notice of another space ahead. With curiosity, they will get close to the projection and wonder what that is. Most will not unveil the secrets of this space, as only through sound will something interesting occur. This means that those who engage with each other will make sound by talking or singing will see something that those who sit quietly and alone may not get to see.

6.3 Visual effects development

In the visual exploration phase, the goal was to follow tutorials and articles; to try adjusting, adding, modifying, creating from scratch, switching nodes, and orders, adding effects in different ways, implementing recognizable biosemiotical symbols, and to animate them smoothly. This phase resulted in more than 75 different TD projects (.toe) of different phenomena and structures; one key value of the software is that the project files are no more than 10kb on average, allowing for much experimentation and constant saving. A small technicality for further understanding of the process here exposed is that a TouchDesigner project is a .toe file and a TouchDesigner module is a .tox file. They do not have many differences, besides the fact that .tox files are a group of nodes, called networks, saved in a file that can be dragged into a .toe project. The .toe files can not be imported into an open .toe project unless that network is saved as a .tox.

The experience intended to make use of geometrical visuals, and so the study of the Golden ratio, phyllotaxis, platonic solids, hexagonal stacking, branching fractals, Voronoi, reaction-diffusion was conducted, as to understand their mechanisms and how to replicate them in TouchDesigner. The first thing before even starting to develop any visual was the creation of a digital mood board using Pinterest; in it, different visual references were compiled, with real images and computer graphics renders relating to natural, organic, structured, fluid, and pattern-like themes. Another valuable source used was the online repository of digital morphogenesis, which can be found in the sidenotes. It consists of many different algorithms and provides different implementations and articles for each which was a great source of knowledge.

For the development of the visuals, the fourmain techniques used were:

- Reaction-diffusion
- L-Systems
- Particle systems
- Voronoi

1) The reaction-diffusion node network is relatively simple to build but is organic looking, flexible and highly customizable. It can be made to react to sound, it can fill pre-determined shapes, grow, disappear and many other
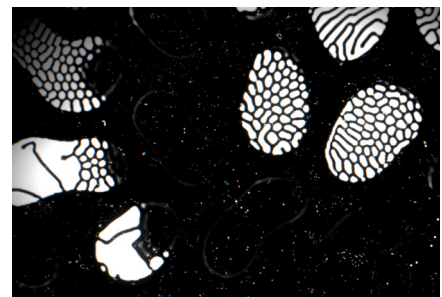
Figure 64 *System A* visual output

Figure 66 Simple reaction-diffusion network

Figure 65 Usage of reaction-diffusion in *System B*

things. This technique is found in the patterns that appear in the *Breathing Space* when the visitor is still (Figure 64) . It is also found in Morphogenetic Nature in the form of cells and coral-like structures (Figure 65) . It is built in TD by feeding an input texture and doing a feedback loop where each iteration blurs and applies sharpen to the texture. Then a displace can be added to animate the effect. A **Level TOP** is also useful to control the brightness or the opacity of the effect.

2) The L-System is a language developed by Aristid Lindenmayer in the late 1960s. This language was created to help model, describe and recreate the complex but obvious algorithmic growth pattern of plants. Although only 3 visuals in the final artifact are L-Systems, the study of this language was very important and the exploration of the TD built-in *L-Systems SOP* tool was long. Mastering this tool is a challenge, both due to lack of quality documentation – much of the information was taken from Houdini FX tutorials, which has a similar L-System tool – but also because there are many parameters, details, and formalities in the syntax. During the development of the project, two meetings were held with the visual artist Jonny Ostrem, in order to ask for clarifications and help with the tool.

3) Particle systems are trivial in TD: create a cube with **Box SOP**, connect it to a **Sprinkle SOP** to create particles, and then we can animate them with a **Spring SOP**. This was highly used throughout the visuals, as it adds an organic, floating, microscopic liquid / galaxy-like quality to the visuals.

4) The Voronoi structures were developed from scratch, as no TD tutorial exists around the creation of such a pattern with controllable points as cells. The fundamentals were learned from a blog post for GPU rendering of Voronoi (Wellons, 2014). In short, each cell is a cone with a random color attributed to it. A camera looking from above will see Voronoi-like shapes as the cones intersect each other. Because the colors are different we can apply an edge detection and the resulting image is a series of lines in the shape of a Voronoi pattern.

The visuals had to be fluid, without any stutters or bugs, and as such, it was decided that the clips should be rendered as videos – excluding the reactive live visuals from *Breathing Space* and *Human Community* – so that their narrative, quality, and fluidity were assured. One key technique that although simple was greatly useful was the usage of an *S-Curve CHOP*. With a sigmoid curve, the smooth and controlled growth and flowering of the visuals was easy, and the timings between the parameters were also more precise (because the operator also has parameters for prepending and appending a steady value) without having to worry with keyframes and timelines.

The early phase of the process had the goal of training and refining the techniques for the visual generation. Here are some of the first prototypes of visuals developed. Some with Processing 4, others with Blender 3, and the majority with TouchDesigner 2021. Some were attempts at recreating concrete phenomena, (Figure 67) others are more abstract (Figure 68).
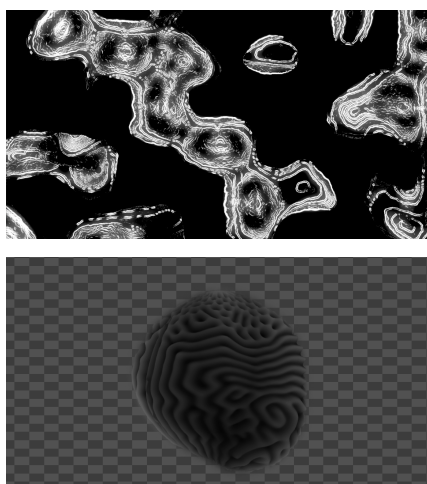
Figure 67 Abstract approaches
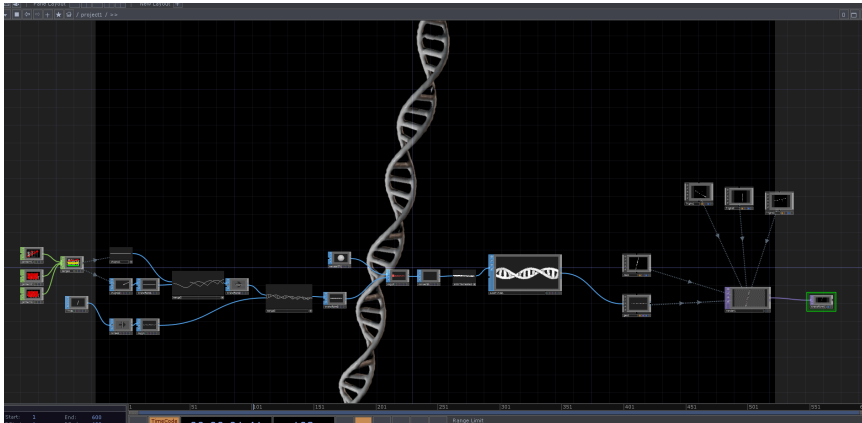
Figure 68 Concrete approaches
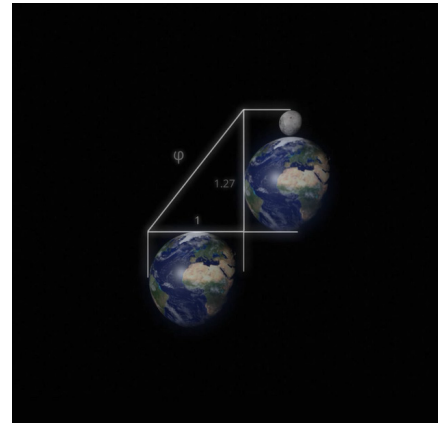
The main TD workflow which concerned the research of different implementations of the visuals idealized followed a highly iterative process as shown in Figure 69. In essence, the "visual.toe" element represents one
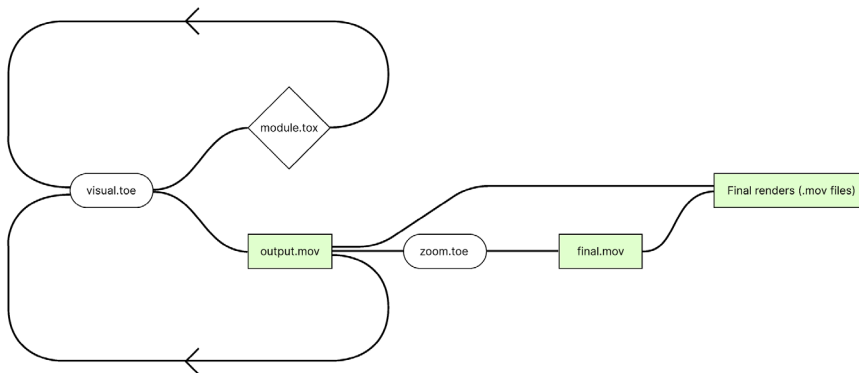
Figure 69 Main TD workflow: an iterative process

of the +75 project files that this process generated. The .toe project would be perfected in terms of tweaking parameters, speeds and removing glitches until a decent state was achieved. From here, the project would either be rendered as a .mov file, or the main network would be exported as a .tox module. This was the key advantage in the visual development process, and it definitely allowed for faster development and better quality of the visuals. Not only that, but there was the flexibility of choosing between a module which is editable and a video that is static but predictable. Both the module and the video can be re-imported into a future "visual.toe" to create a new visual, a technique developed to easily add complexity in layers.

Upon arriving to a satisfactory visual, the resulting render would be fed through "visual.toe", a small post-processing project where fades, camera zoom, shakes, blurs and other effects were added and a .mov file was rendered. In this part of the process, the timings and the fluidity of the animations were approved for the next stage of the workflow or disapproved and improved or discarded. An approved visual is moved from the iterative video folder into a final renders folder: the folder where the "system_B.toe" is sourcing the 21 clips, this system will be properly explained ahead. For the live performance, TD was also used to manage everything, from sound, video, and interactivity. Three systems were created, one for each space or

projection, and more about them can be found under the Systems section.

The zoom.toe phase of the workflow makes use of layering and compositing of different videos to add complexity. In this phase, a gentle camera shake is added, and zoom is animated to preference, as to zoom into parts or zoom outwards. It also adds a vignette and blur on the screen edges.

The visuals generated by the live *System A* changed very little, as this artifact was one of the first to be developed. The visual guide was tried with a recursive spiral but ended up being done with an organic blob. This visual was heavily inspired by mindfulness-related content that surfaced the internet as a way to ground people by following the pace of the animation (Help Yourself Relax with These 6 Calming Breathing GIFs, 2022).
The timing for that blob was created according to a Berkley University informative pamphlet about breathing exercises (Breathing Exercises Abdominal Breathing Technique, n.d.).

The visual that flowers when there is stillness was decided to be a reaction-diffusion system for its flexibility, but a growing fractal and a particle system was also considered. In the end, the movement triggered a reset of this system by setting the contrast of each feedback to a low value, and slowly increasing the contrast levels higher with time if no movement is detected.

Equally, the visuals generated in *System C* were also made early on, undergoing little to no change. These visuals are composed of black and white noise that enters a feedback loop where the image is distorted and overlapped, creating trails and spirals.

6.4 Systems

As previously mentioned, three systems were developed, one for each projection or each space of the installation. Each system manages sound and video inputs and outputs. Two computers were required to assemble the installation, one for *System A* and another for Systems B and C. However, *Symbolic humanity* does not have a system associated as it consists of printed artifacts. The systems and computers correspond to the spaces mentioned before as shown in the Installation planning section before.

The *Breathing Exercise* is further away, as to avoid any sound interference with the *Morphogenetic Nature* (*System B*), hence why it is being run on PC 1. *System A* (shown in Figure 70) consists of a Kinect input controlling a reactive visual, a song list for the system to cycle through, and a blob
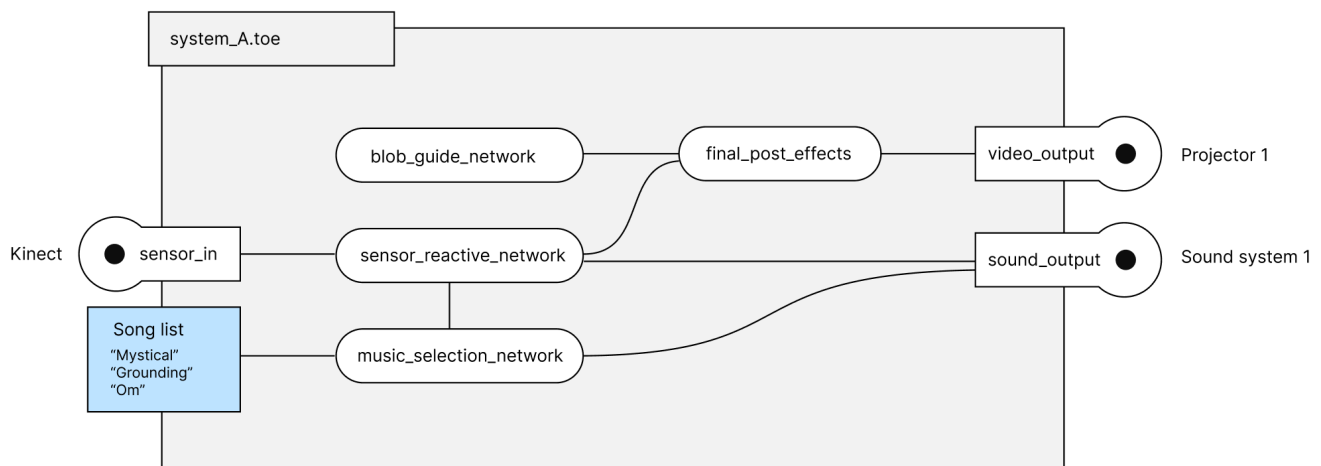
Figure 70 *System A and its networks and connections*

expanding and contracting, alongside subtle text cues to guide the breathing and subjective state of the visitor. This all passes through a series of final visual effects, such as chromatic aberration, and proceeds to *Projector 1*. The songs being cycled are outputted to the *Sound System 1*. The music being played affects the reaction-diffusion visuals and the sensor detects
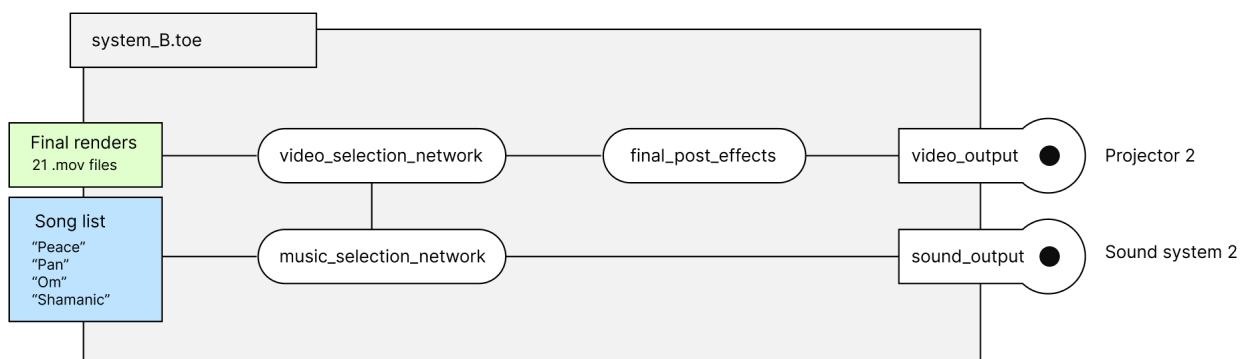
Figure 71 *System B*

movement and emits a generative static noise to the sound output, as auditory feedback of the system.

System B, or *Morphogenetic Nature* (seen in Figure 71) is composed of a node for selecting videos from a folder – similar to the music selection network. From here, the only thing worth mentioning that happens before the video and sound outputs are the post effects adding chromatic aberration, vignette, and some blur, and the music being played affecting the visuals.
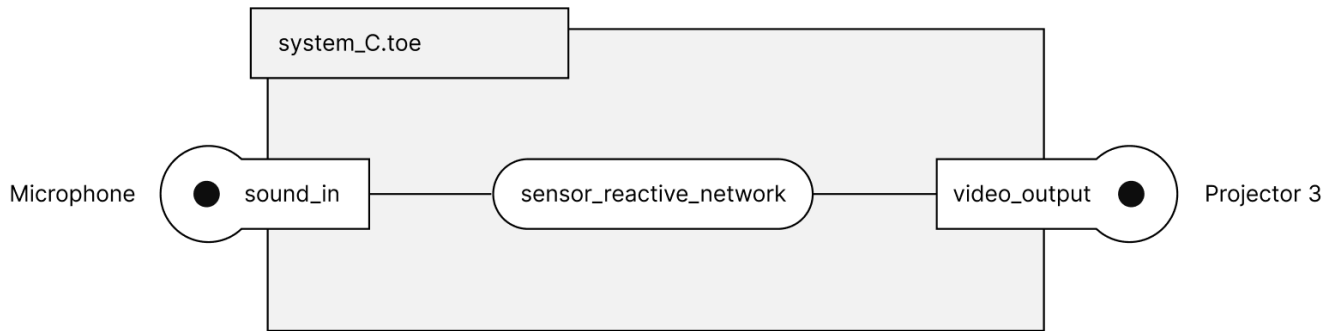
Figure 72 *System C*

Last but not least, is *System C*, (Figure 72) which is responsible for capturing the sound from the microphone input and using the intensity to control certain parameters of the projected fire. Directly proportional to the intensity of the sound captured with the microphone is the displacement of the feedback loop, copying and pasting the original noisy texture while deforming it with another noise giving it a wrapping effect. After a few seconds of continuous sound interaction (either by singing, clapping, talking or playing an instrument) there is a switch condition in the network that adds color to the visuals, being this the only colored artifact of the whole installation, if we exclude the chromatic aberration added on white visuals over a black background.

The systems may require minor tweaks depending on the components used. The audio output device must be changed in the Audio device Out CHOP, and the same for the Audio device In CHOP. The projector resolution should also be inserted in the project's width and height parameters. The technical rider is found in the Appendix.

6.5 Sound design

The sound design was a very important aspect of the installation, and it was worked on carefully. Due to previous experience in music production and sound design, it was a natural task that allowed for a very exploratory approach, without compromising quality. This resulted in a series of tracks that are quite different but build an overall theme together without overpowering each other.

During the initial phases of development, a Spotify playlist was created. The goal was to compile references and inspiration, similar in function to a mood board, but for the audio domain.

Some music artists were contacted to request permission to use songs in the installation. Hiatus, Jon Hopkins and Yaima were all contacted, with only Hiatus allowing the usage of his music in the project. Although the project would gain a lot with some songs by these artists, the real value for the context of this dissertation is in the self produced songs and as such we ended up not using any songs.

The sound design of the installation made use of field recordings of singing bowls, natural settings, rain, and foley. Some of the audios used were recorded for this project, others were royalty-free sounds from web archives (the list is found in the Appendix) and other sounds were taken from a sample pack of shamanic sounds named "Deep shamanic sound journeys" by Harmonic Resonance.

Besides audio samples, a few virtual instruments were used, namely Ableton built-in synths, granulator II, Spitfire audio LABS Dulcimer, and India from the Kontakt's Komplete collection. The digital was layered on top of the organic textures creating melodies and a narrative, without overpowering the organic and gentle natural ambiance. The melodies and chords were intuitive and expressive. The percussion was inspired by Eastern and indigenous drumming.

Composition wise, the influences were oriental and indigenous mostly with some influences of Western music. The goal was to create a series of soundtracks inspired by different cultures, making them more universal.

Musica de Medicina, as previously mentioned, consists of a musical expression commonly used in shamanic rituals of Amazonian tribes (Villena, 2021; Winn et al., 1989). The songs, like in the psychedelic therapy protocol, are essential for the guidance of the psychonaut. These Medicine Songs were not included as they would add a strong verbal message which although very aligned with the project should be used in a more ceremonial performance, namely by playing the songs live instead of recording, which could be done in the installation, making it include a performance. Nonetheless, the lyrics can be too suggestive, cheesy or ridiculous for the general public and that would add a barrier to the openness the experience seeks to create.

However, the shamanic noises, blows, whispers, clicks and many other sounds used by shamans in ceremonies, or the *Musica de Medicina* did influence the sound design. The former influenced the textures and the choice of using a recording of an Icaro singing. The uplifting chord progressions and the natural aura of *Musica de Medicina* was captured in the songs created.

Besides the tracks being played in cycle, ambient noises were added through a hidden speaker in the space. Three long audio files of natural background noise were made from smaller audio files also from free online archives, fading in and fading out in a very long and smooth transition. These three files were played in a looping playlist on the speaker to help create immersion. In certain natural spaces, the local sounds (birds, animals, rivers, waterfalls, etc.) are loud enough to create immersion by themselves, and the speakers playing the three sounds may not be always necessary.

The interactive *System A* outputs a static noise to the speakers, which is generated by TD in real time, allowing for an auditory feedback of the system. The process was simple and consists of a network that takes r which is the normalized value coming from the Kinect sensor, which then defines the amplitude of two Oscillators, and then combine them using frequency modulation as seen in Figure 73.
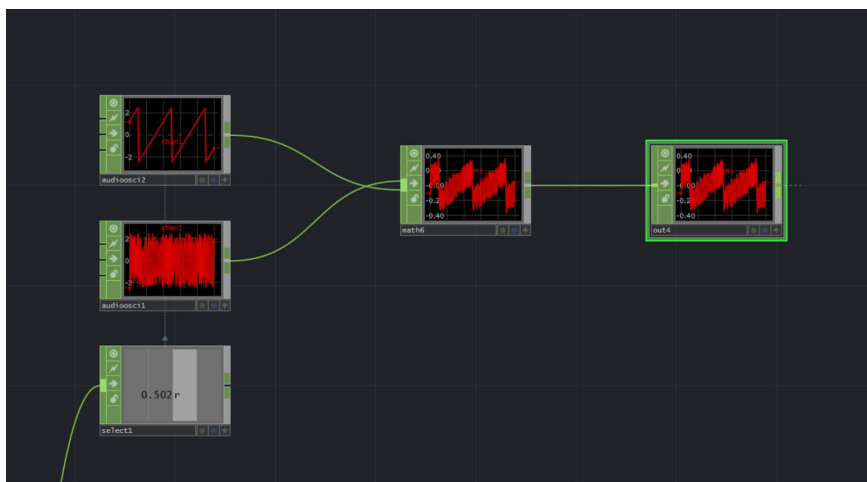
Figure 73 Simple sound synth in TD

The structure of each track is shown in the Appendix and the songs can be found on the playlist on the sidenotes.

The ambiance consists of three sounds that were extended:
- Crickets ambiance
- Forest ambiance
- Forest creek

6.6 Banners

The banners were inspired by psychedelic tapestries that glow in UV light. They started to be an informative and literal description of certain natural geometries such as the golden ratio or the sine waves. The goal of the banners then pivoted to something different: to artistically express a language halfway between that of humans and nature. The banners had their visual language heavily inspired in hieroglyphic writings and mystical visions. As if holographic symbols were appearing in front of the visitor. For such, the banners were two: one that represents the languages of different human cultures and a banner that represents the overlapping language between humans and nature. The banners were idealized to be bright white, UV reactive print on a black background to be placed under ultraviolet lamps and create a glowing effect.

To begin creating the banner, there needed to be kept a repository of the symbols being used. Most symbols were extracted from free fonts of different cultural writings listed in the appendix.

Some of the symbols were created by hand, such as the Buddhist wheel, the peace sign, the ouroboros, the unicursal hexagram, and the flower of life, to name a few. Other symbols were taken from public domain image banks, and the list can be found in the appendix.

With these building blocks, the development of the banners began. At first, the displacement of the symbols in a chaotic manner was sought, as to avoid personal bias in the message and to encourage a more spread out interpreted importance of each symbol. This was the first version of the main banner when it was horizontal as seen in Figure 74. It was then suggested that an artistic exploration of the symbols should try to convey a story or message in the way the symbols are placed and in relation to each other.

The second version of this banner (Figure 76) was developed with more intentionality and meaning beginning with the vertical axis to honor the symmetry in all things, the Yin and the Yang, day and night. It has a center of axis that guides the sight down from the primordial and universal Om into matter, duality and the five elements or the five platonic solids. The five elements are often depicted as the pentagram, an old symbol associated with the mystical, and demonized and appropriated by pop culture to

Figure 74 First designs of the first banner

Figure 76 First banner after improvements

be associated with negative things such as demons and the occult. The pentagram, in truth, is a harmonious shape that contains the golden ratio in many ways used by the Pythagoreans, Wiccans and many other groups and cultures, found in flowers and vegetables such as the five-fold symmetry of an apple sliced horizontally. Another shape that gives us a golden rectangle with very high precision is the icosahedron, one of the platonic solids. The pentagram that originates the five points of each element can be found inside a pentagon. This pentagon has one side directly adjacent to one side of the hexagon. This formation of pentagon-hexagon is found in tryptamines, in the case of this banner, DMT.

Then from the pentagon, we get the hexagon. The hexagon is fundamental and present in many natural phenomena, from the stacking of cells to beehives. In the hexagon, we can find the flower of life: a pattern of great harmony with certain proportions worth studying. More specifically, with a single compass one can draw the flower of life and find the hexagon. The encoding of these symbols and laws in matter and geometry is extremely interesting. Through the deep study of these geometrical axioms, we shall gain a great understanding about the way symbols and matter interact. We will better understand why these archetypal expressions appear in so many different conditions and scales, because for now, some of them remain mostly a mystery such as the hexagon in Saturn's pole or the golden ratio in plants and DNA strands.

In the center the eye of "God" shines through. This is not the classical idea of the Abrahamic God. The eye of God in this sense could be interpreted as the perception and self-awareness we possess; a high level of consciousness that allows for self inquiry, self-analysis and self criticism, leading to new experiences, learning and evolution.

Below the holy presence of divinity, rains down the language to try to express it. Different characters from different languages appear with the sacred geometrical of the Kabbalah, Sri Yantra, Metatron's Cube ending in the infinite cycle. The snakes are a central figure in mystical visions, and they were included on the pillars of religion to represent the fear of death and also as a reference to Kundalini, the yogic system for controlling an energy symbolized as a serpent that resides in the base of the human spine

Figure 75 Second banner

which allegedly contains great powers.

Near the ground one can find the pillars of religion solid in the ground that holds the pyramid of spirituality where we can find the eye of god, and the principles of peace and love. In the base of the pyramid mushrooms grow in reference to the psychedelic nature of spiritual and mystical experiences which gave birth to religion; in short, to emphasize the psychedelic source of religion, though much has been perverted along the years. Around the pyramid are represented the main religions of the world, in a ecumenic and respectful way.

The second banner designed did not change much throughout its development (Figure 75), as more languages were added progressively. This banner consists of a representation of a series of human languages in an effort to celebrate the different forms of expression, but also to point to their limitations. By having many different languages, the message is of humanness over culture, religiosity and nationalism.

A quick render was done in blender to test the glowing appearance of the UV reactive paint over a black background as seen in Figure 77 on the next page.

Figure 77 Renders of the banners to simulate glowing ink

6.7 Environment design

The space and environment of the installation are very important to accurately convey the message. This means that besides the natural space, thoughtful considerations were made as to how to improve the space for the installation. The choice to place the installation in a totally or mostly natural setting was the most important one in the environment design process.

The lighting of the space was conceived in order to improve the navigation of visitors through the installation. It was first idealized with the UV light for the banners, but it became more general. It is a simple detail that hugely improves the experience.

This resulted in the development of hanging structures, that use thin cord to assemble sticks into holding pine cones; or branches hanging out of pinecones; or even feathers hanging from an horizontal stick. All this, to improve the conceptual bridge between the digital and the real.

Hanging mobiles

The hanging artifacts resembling mobiles are an element that is flexible and modular. It is crafted with natural elements such as: sticks, pinecones, branches, feathers, and shells. These should preferably be sourced from near the space of the installation and must be collected without destroying or hurting organisms or the ecosystem in the process. The combinations are infinite, and some examples are shown in Figure 78.

Conceptually, they can be compared to ready-mades, as they are taking an object – in this case, a raw natural object – from the ground of a forest and placing them in a different context and disposition, adding a layer of symbolism and message to the artifact. Taking things that are usually in the ground and placing them at the level of the eyes makes them more noticeable and that serves to repeat the patterns shown on the rest of the installation on the real side of the mixed reality spectrum (Benford & Giannachi, 2011).
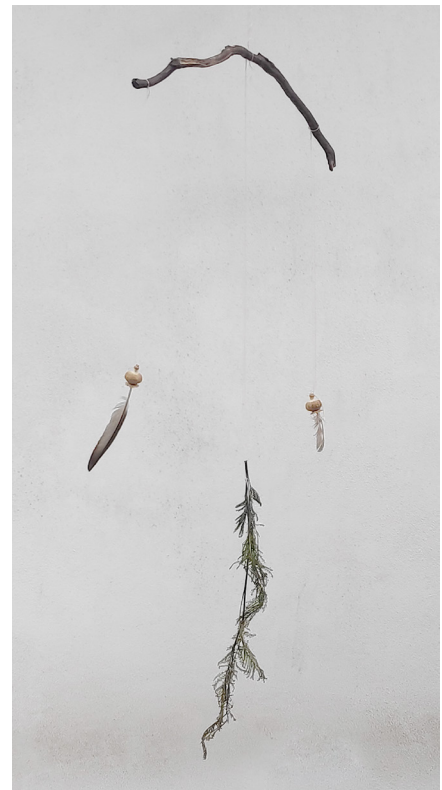
Figure 78 Different combinations of natural elements to compose various mobiles

Lighting

The lighting of the space is very important for the guidance of the participants throughout the experience, but also as a dimension that adds to the whole environment. The lights are also warm and reminiscent of our old times as a species. The lighting of the space was done using candles in protective glasses to minimize the risk of fire hazards. In a public demonstration, fire extinguishers should be placed nearby. If the usage of candles is not possible the fallback consists of so-called fairy lights stretched out. Both the candles and the lights should be placed along the limits of the usable space, placing more emphatic lighting and even using physical barriers like logs, benches, or other big objects near potentially dangerous places or in sections where the confusion of navigation is likely.

In complement with the soft limits created with the help of candles and fairy lights the usage of a UV led strip is established. The ultraviolet light will react with the UV-reactive paint on the banners, to create a glowing effect. The light should be placed to illuminate the banners directly such as on a tree. A led strip is recommended for flexibility, but other types of UV lights work.

Figure 79 Lighting ambiance with candles

6.8 Installation assembly

The assembly of the installation is flexible, in the space used, the materials and the technological components. However, it must fulfill a series of requirements for the accurate and reliable transmition of the original idea. The specific requirements and guiedlines for the correct connections will be now covered.

Technical requirements:

-Kinect sensor: TD has a specific Kinect TOP to handle the device and therefore the input must be always a Kinect device v1 or v2

-Sound system: must be stereo and output 60-70 dB of sound

-Projectors: must be +600 lumens, full HD or 2K

-Microphone: must be of the condenser type and needs wind filter

Assembly requirements:

-The installation has to be placed in a mostly/totally natural setting, with some combination of trees, plants, rocks, and animals.

-It has to be on a clear day, and preferably on a warm day.

-It has to start at sunset to allow the projections to be visible.

-*Projector 1* needs a flat screen/wall to be projected.

-*Projector 2* can be pointed to a flat screen/wall or to a mostly flat bright natural structure (large tree, boulder, etc.)

-The *Breathing Exercise* must be placed in such a way that little sound from *Sound System 2* reaches it and no visual contact with the rest of the installation can be made by visitors while in this first space.

-The path must follow the trajectory defined, and lights/candles must mark the limits of the installation.

-Each space should provide seats for visitors (3 to 6 per space). For the *Breathing Exercise* zafus on top of a blanket is recommended to encourage the correct posture for breathing exercises. *Morphogenetic Nature* requires seats facing the projection. For the Human community space, the seats should be placed around the central projection to resemble a fire pit gathering.

-Near the Human community's seats, musical instruments such as guitars, shakers, ukuleles, etc. should be added to encourage sound interaction.

With these requirements in mind, the technical blueprints show how the installation was assembled in the second testing session. The first image illustrates the setup of *Breathing Exercise* consisting of PC 1 and its peripherals. There can be 1 or 2 power sockets (computer, projector with battery) and three connections made: one speaker (Bluetooth), one Kinect (USB), and one projector (HDMI).

The second image depicts the setup of the *Morphogenetic Nature* and Human Community PC 2. This computer is running two TD projects at once (*System B* and *System C*), has two projectors connected (2x HDMI), and one soundboard (USB) to receive the audio from the microphone and to output the music to the speakers. The microphone should be placed under the circular white fabric where the projection is, or near it, in a hidden way. It specifies 5 (five) power sockets in usage. Again, this was the setup with the materials at hand. Better or different devices and connections can be implemented, which means that these blueprints are changeable and not final. The final technical rider used for the evaluations can be found in the Appendix. A demo video of the installation can be found in the sidenotes.
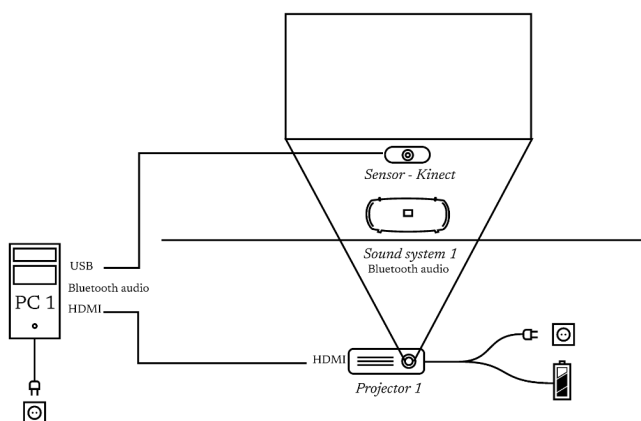
Figure 80 *System A* and how to assemble it
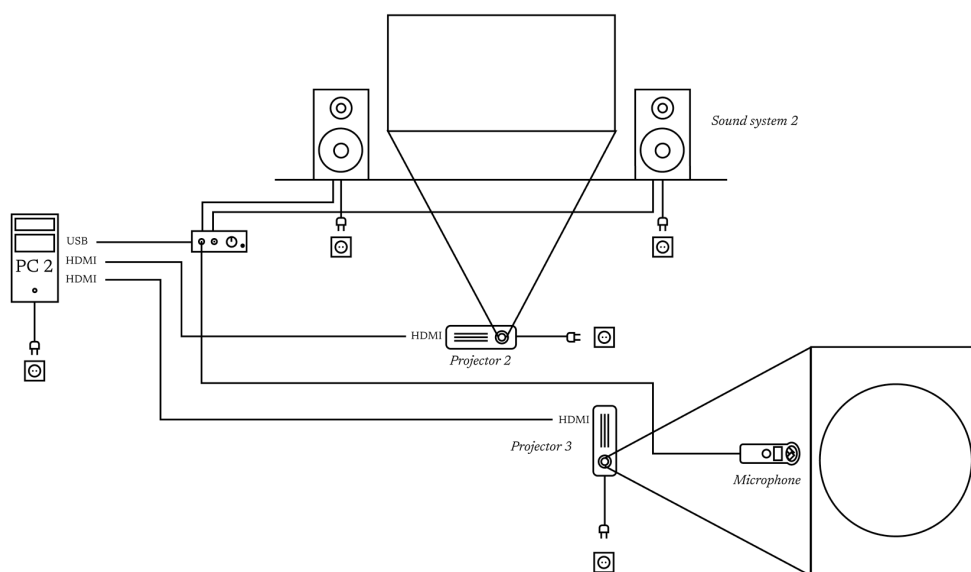
Figure 81 *System B* and C and how to assemble them

7. Experience Evaluation

Now we will evaluate the experience and its interpretation by the visitors. We will first outline the profile of the participants, then we will expose the protocol followed, then the data resulting from the evaluations, and finally the analysis of the resulting data.

For the evaluation, two separate sessions were conducted in two different spaces. This puts the coherence of the installation to the test. No changes were made besides a change in two peripherals: the *Sensor* and *Sound System 1*. Besides that, the installation assembly was followed rigorously, in order to minimize the variability inherent to placing the installation in a different space.

7.1 Participant profile

The participants were mostly in their 20's and were of diverse gender identification. The majority was from a design background, such as UI/UX, Graphic and Multimedia. Most identifying as Agnostic atheist. Refer to Figure 82.

Gender

Field of work / study

- Data science
- Design
- Computer Science and engineering
- Engineering and industrial management
- Anthropology
- Medicine
- Management
- Advertising
- Education
- Economy
- Multimedia
- Dentistry
- Psychology
- Cinema

Female

Male

Other
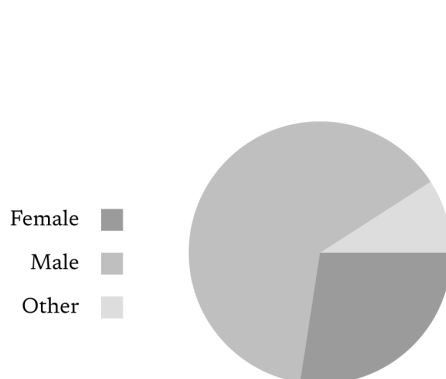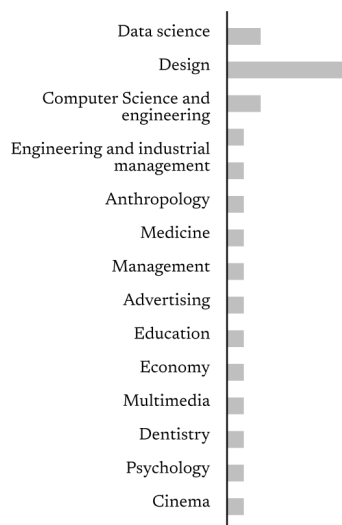
Spiritual/Religious beliefs

Age

- Gnostic atheism
- Agnostic atheism
- Gnostic theism
- Agnostic theism
- Christianity
- Buddhism
- Paganism
- Shamanism
- Spiritual (non-religious)
- Has no opinion
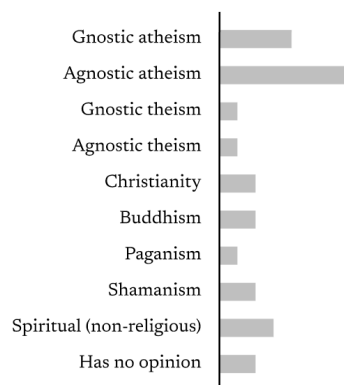
Figure 82 The participant's answers to the form

7.2 Testing protocol

The process started by establishing what we are evaluating, why, and how. We are evaluating a new media art installation, and although little information about testing this specific type of medium was found, the foundational concepts are assumed to be closely related to those used by UX/UI or game evaluation, which helped shape the evaluation design. In terms of why we are evaluating an art installation, it is so we can assess the subjective impact and interpretation, and identify any issues affecting the intended purpose of the work. This is important, even though it is an art piece, the subjective changes, triggers, insights as well as the technical performance of the installation must be understood.

As for the testing protocol, a form was designed to collect relevant data. This form starts to collect demographic data, such as age, gender, and area of study, and proceeds to the current state of the visitor, before the experience. The form changed, as it was mostly focused on ratings in the beginning. It became more subjective, including text inputs for open expression. The goal was to ask the visitor to report the experience from a personal perception standpoint.

At first, there were two forms, one for scheduling and collecting the demographic data and another for after the experience. This was quickly discarded, as scheduling would add more logistical issues, and the experience is flexible to accommodate one, two, or more participants at different times, without requiring any reset or preparation between testers, and as such, the overlap of testers was actually desired. In the end, one single form was designed, which contained a stop section with a visible stop symbol separating the questions destined for the before and after the experience. The participants were verbally instructed to fill out the form just until that point and then to enter the experience, bearing in mind that the installation is cyclical and that as the visitor they are free to move along at their own pace, including when to finish the visit and to fill the rest of the form.

7.3 Data collection

To collect the data two methods were used: the online form and written observation notes of particular interactions, trajectories, or comments by participants. As the participants arrived at the space, they were instructed to remain in a space away from the installation and fill out the form given through a QR code on a phone screen until the STOP page. The participants were left undisturbed and told to take their time, staying distant to avoid participants from feeling embarrassed or analyzed, but approachable for any questions relating to the form or the experience.

During the experience, the visitors were left mostly alone, except to direct them back into the installation space when they got too far because of being in exploratory mode. Their sense of focus was analyzed to assess the level of immersion in the experience, with a small number of people taking the experience lightly and in a hurry. The directions given were all before they entered the experience and were limited as to allow for an authentic exploration, without feeling watched or monitored. The fact that some participants left the space indicates that more focus should be put on the layout of the limits and paths.

The resulting data can be found as a table in the Appendix. In it, the question structure and the answers by each participant can be found. The questions and answers are in Portuguese because the tests were done in Portugal and had the goal of being acessible to most participants. The data on that table was used to create visual graphs, excluding the qualitative and open-text answers. The resulting graphs help visualize the ratings regarding visual, sound, and interaction; a word bubble of prominent keywords used to describe the experience; and the frequency of concepts recognized by the participants.

7.4 Data analysis

The resulting data was a combination of quantitative ratings and demographics and qualitative reports of prior and after the experience.
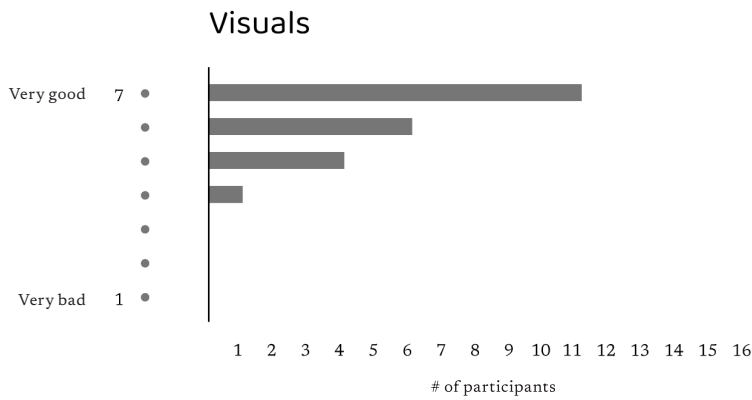
Visuals

Figure 83 The ratings for the experience visuals
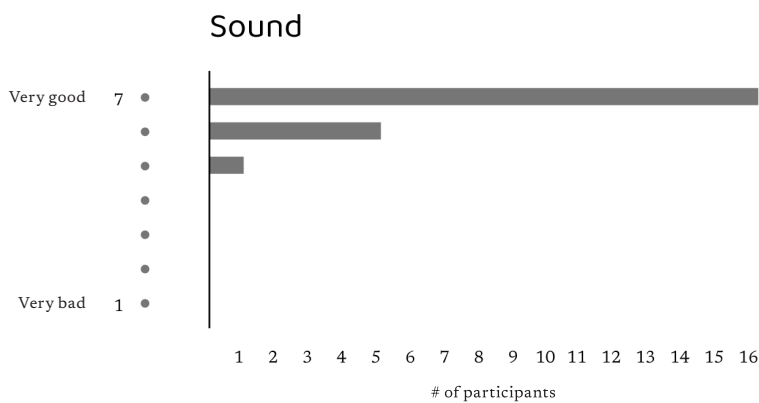
Sound

Figure 84 The ratings for the music of the experience
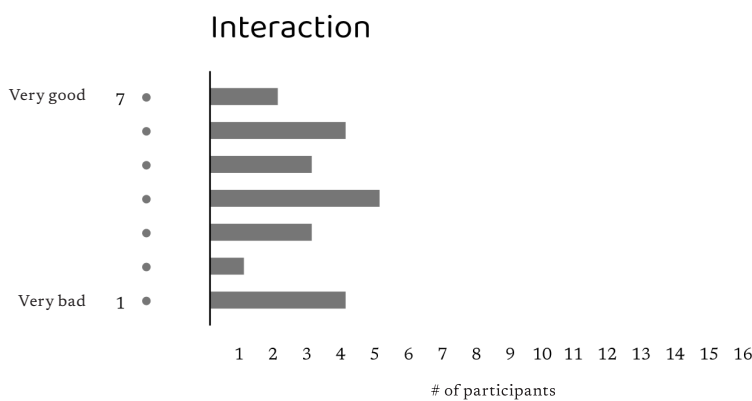
Interaction

Figure 85 The ratings for the interactivity

In Figure 83 we can see the ratings for the visuals. From this, and in conjunction with some of the textual reports, we can say that the projections did play an important role in the overall experience, and were appreciated by most.

In Figure 84 we see the ratings for the sound, which were overwhelmingly positive. This leads us to believe that sound was crucial and evoking, which some written reports also mention.

The interactivity ratings we can find in Figure 85 shows a higher standard deviation, and overall the ratings reflect an interactive system that had some issues at times.
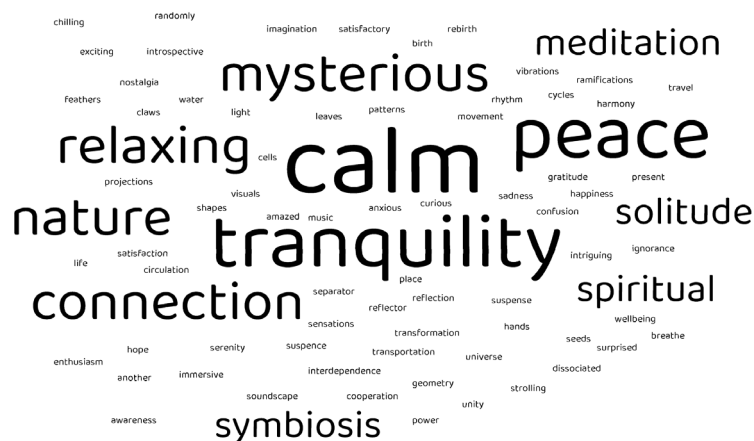
Figure 86 The word bubble generated with keywords

Participants were also asked to describe the experience using only keywords, and that was used to create a word bubble of the most common words. In Figure 86 we can see that bubble and in it the participants' own word as to what they experienced.

Participants also answered a multi-option question to identify various concepts they might have seen represented in the experience, which can be found in Figure 87.

Now, follows an analysis conducted from the notes taken during the tests as participants were monitored from afar. This intends to summarize the visitor's trajectories and interactions from an objective standpoint.

About half of the participants said that they were expecting the installation to indicate when to leave an area or the whole installation. This may be because of the testing setting, which leads the visitors to await further instructions instead of exploring the space freely. After noticing this, the verbal instructions given before entering the experience stressed the fact that the installation is in a constant loop, and that visitors should feel free to move along at their own pace, without expecting any further indications.

The interactivity was previously tested in controlled settings and under real conditions, it was affected. Namely, the webcam quality made it difficult to pick up movement in the dark. This was improved in the second testing session, by using a Kinect device to capture depth data. Another issue was that the microphone captured the wind, making the interaction with sound difficult in windy conditions. To avoid this issue the solution was to use a wind filter.

A few participants were slightly tense and self-contained from the testing setting –

judging by body language and some verbal feedback –, yet most reported calmness during the experience. In an informal setting, the experience should be expected to have a greater positive effect, as it could be received with more openness and exploration.

Although few mentioned it, the cold weather was also detrimental to the transmission
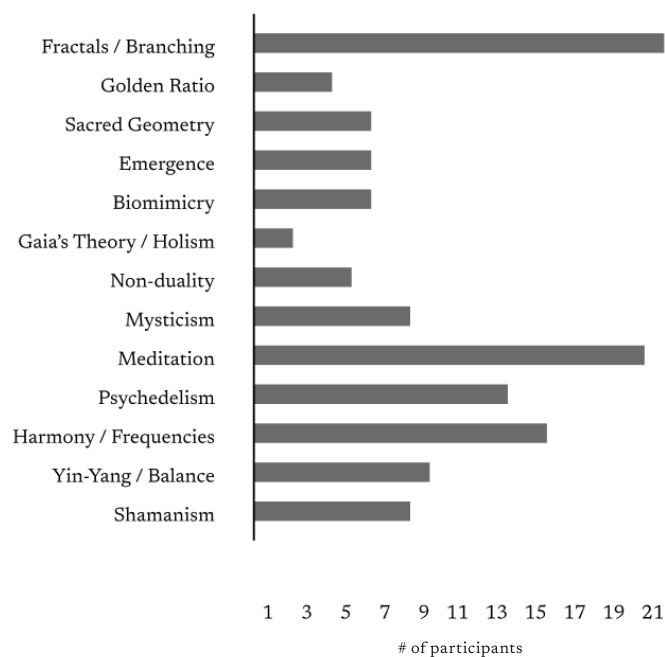
Figure 87 The ratings for the concepts found by the visitors during the experience

of the message, as warmth and relaxation allow for a better sense of what is being communicated here as they physically relax and open the visitor to the experience. The installation is best suited for a warm summer night.

Participants took roughly 7-15 minutes to experience the space, and most took the seats leading to more introspection. This stresses the importance of the previously mentioned sitting blankets, zafus, and chairs. Roughly 35% had the experience in simultaneous with another person, which affects the collected data, but paints a more accurate picture of a space of coexistence that this project seeks to provide as an experience.

As for the qualitative reports, we have an analysis of the questionnaire content lead to the identification of key themes in the participant's written descriptions regarding:

a) How they felt prior to the experience
b) Perspectives on humanity and nature
c) Perspectives on mystical experiences
d) How they interpreted the experience
e) What changes they reported to have occurred
f) How they felt after the experience

a) Pre-testing, visitors were asked to describe how they felt. The answers were very contrasting, sometimes even with the same individual. The most common words that were used to describe the subjective state were fear, anxiety, calmness, hope, thoughts, and tiredness. Individually, people reported some anxiety due to work, exams, and uncertainty relating to their current life's situation and global planetary issues.

b) Most testers share that humanity is an expression of nature itself. The answers about the subject of humanity and nature point to a high level of Eco-awareness in general. Many people also mention our collective lack of kindness towards nature, with some describing humans as having an unreasonable sense of superiority. There are also a few mentions of raw nature providing relief from daily life. Some people mention nature as a doorway for humanity to experience the divine.

c) Overall, participants reported their understanding of mystical experiences by describing them as involving transcendental or alternative states accompanied with novel information and sensations. Some mention the potential usefulness of these states for introspection. The individual descriptions used different language or expressions, which seem to roughly match the person's religious-spiritual beliefs, such as mentions of divinity or sacredness by a minority.

d) After the interaction users were asked to elaborate on how they interpreted the experience, with most describing it as uplifting, inducing feelings of calmness, tranquility, and contentment. The interpretations ranged from a reminder of what we are made of and our environment to a moment of pause, rest, and reflection. Some participants mention the breathing exercise triggered the most noticeable subjective change, to a more calm and present state, with fewer thoughts. There are also some mentions of hope being restored. Some people also talked about feeling taken on a journey, which seemed to us an interesting description, given the psychedelic influences that the project took inspiration from. One participant, in particular, had a rather intense experience of feeling taken back to primordial times and seeing tribes.

e) Reported changes were mostly about finding some acceptance, presence, and peaceful state. Some of the participants who reported "maybe" or "no change" mentioned that it was due to the experience reflecting something they already believe in. There are mentions of feelings of hope and some people mention that the experience triggered a re-framing of the individual's current life situation, allowing for some sense of peace, while not becoming numb and detached from the issues. The key change noticed was a refocus from mundane or stressful things like social media, work, and other responsibilities into more important ones like the present moment and the primordial breath.

f) When asked how they felt after the experience, visitors shared they felt more relaxed. The contrast is noticeable, with most using words such as "more relaxed" or "more calm". A cluster of themes found in the reports include calming and peaceful feelings, increased presence and awareness, introspection, acceptance and hope for the future, meditative or contemplative experiences, connection to the environment, relaxation and release of stress, amazement and satisfaction, and a change in perspective.

In summary, the experience allowed for a time of pause and reflection, which some visitors say helped them feel and organize their ideas, and emotions. They also mention that the experience helped them become more present and grounded, with some talking about feeling focused in the now, as well as feeling safe, secure and empowered.

Some participants also mention how the natural setting and the environment design adds to the message interpreted by them. They also report that the images and the sound added to the immersiveness of the experience.

7.5 Conclusions

In conclusion, the visitor reports show a strong theme of well-being, heightened awareness, and connection to self, emotions, and surroundings. The art installation experience is described as one that allows for the release of stress and negative emotions and encourages presence in the moment. We can say that the installation allows for introspection and personal growth. The visitors also feel a connection to each other, the environment, nature, or the world around them. Overall, the art installation seems to have had a positive impact on the mental and emotional states of the visitors.

With the evaluation concluded, and with the resulting data thoroughly analyzed, we can conclude a few things. The major takeaways are that the interactivity could be significantly improved and that Symbolic Nature has been successful in triggering some of the desired subjective experiences in people.

The evaluation results confirm that the experience did bring a sense of calmness, presence, and appreciation. It seems that the natural and harmonious visuals reinforce those feelings of calmness and appreciation and those feelings in turn reinforce the appreciation for nature being evidentiated in the audiovisual piece, creating a feedback loop. The results also indicate that the experience triggered most participants' introspective moments, which mostly helped them make sense of certain personal issues and become more grounded. This is exactly what the goal of the project was and that is a huge achievement.

8. Conclusions and future prospects

The project proposed began with a technical and artistic study of new media art and technology, as well as environmentalism, ecology and human psychology. The concept to create an immersive installation that seeks to erase the boundaries between internal and external sought to use visual patterns and algorithms as well as music and environment design to create a space that does not tell a story, but gives the opportunity for the visitor to tell their story and carve their path in it.

The process ended up creating a high volume of visuals and animations, most of which did not end up in the final artifact. It involved the study of the world of multimedia art and mysticism deeply, in order to craft a peaceful and evoking environment. It did so in its own artistic way, which had a profound impact on some visitors but remained meaningless to others. Some felt peaceful, while others felt connected to other people, to nature, or to themselves.

Crafting an Artistic Statement was important as it allowed for a more free expression of the vision behind the experience while keeping the pragmatic and technical parts of the document more clear and separate from intentionality and personal views.

The subjective impact the experience had on visitors was mostly aligned with what was intended during the development process, which means that there was a shift in the perception of visitors, usually for the good. Most visitors report feeling connection or more well-being and grounding, which is a success. In essence, the project attempted to help nature communicate to the visitors, through what seem to be the values of nature in general: order, balance, cycles, harmony, and cooperation.

If the installation can trigger non-dual states of awareness or transmit specific messages of holism or sustainability is still uncertain, but it has shown to be able to reinforce the feelings of connectedness, which was one of the main goals set at the beginning. Nonetheless, these feelings of connectedness may indirectly influence the visitors views about holism or sustainability.

Technically, the results were satisfactory, though even more diverse visuals could have been explored. For example, sound design synchronized with each specific clip from the final renders; in this way, besides the soundtrack, a woosh or textured sound could be added in sync with the animation, to add more dimensionality, impact, and realism. As mentioned, an exploration of the more geometrical structures could also benefit the message, in a visual bridge between the banners and the projections. The banners, for instance, could include a third banner with more organic and morphogenetic structures.

Regarding the core message, it is noted that the banners are an important aspect of the installation that was not included in the tests. As of now, the visuals and patterns of the experience are mostly organic, which proved to work well without the banners. The message was felt by some visitors

as it was idealized and that is a success, although the value of art is in the different perspectives and interpretations. The message here presented can be misunderstood due to its complexity, but the best efforts were done to simplify the ideas and to deliver them in a rational way. Still, perhaps due to the nature of the message, there is room for improving the way this topic is approached in an academic context.

In conclusion, we can say that this installation has been able to introduce many people to meditation and induce feelings of well-being and connection. Given that the installation is relatively easy and cheap to install – besides being flexible and adaptable – that allows for the installation to be included in different spaces, conditions, and events. Overall, it is a good indicator that multimedia installations have the potential to spark systemic change regarding environmentalism and sustainability, starting with the individual. The process is slow, but steady, and this project hopes to raise the voice of sustainable messages; environmental or social.

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Appendix

Evaluation dataset

ID	Ano de nascimento	Género	Área	Religião / Espiritualidade
1	2001	Masculino	Ciência de dados	Ateísmo gnóstico
2	1996	Masculino	Design e Multimédia	Teísmo gnóstico
3	2000	Masculino	Engenharia Informática	Ateísmo gnóstico
4	2000	Masculino	Engenharia Informática	Ateísmo gnóstico
5	2003	Masculino	Engenharia e gestão industrial	Não tem opinião
6	1998	Feminino	Design	Espiritual (não religioso)
7	2000	Feminino	Antropologia	Ateísmo agnóstico
8	1998	Masculino	Design	Ateísmo agnóstico
9	1999	Outro	Design e Multimedia	Ateísmo gnóstico
10	1994	Feminino	Medicina	Teísmo agnóstico
11	1999	Outro	Design UI/UX	Ateísmo agnóstico
12	1996	Masculino	Design	Ateísmo agnóstico
13	1994	Feminino	Gestão	Shamanismo
14	1973	Masculino	Terapias / Publicidade	Budismo, Paganismo, Shamanismo
15	1973	Feminino	Educação/ formação	Cristianismo
16	1999	Masculino	Economia	Ateísmo agnóstico
17	1996	Masculino	Ciência de dados	Ateísmo agnóstico
18	2006	Masculino	Multimedia	Não tem opinião
19	1972	Masculino	Design grafico	Espiritual (não religioso)
20	1999	Masculino	Medicina Dentária	Teísmo agnóstico
21	1998	Feminino	Psicologia	Ateísmo agnóstico
22	2002	Masculino	Cinema	Cristianismo, Budismo, Espiritual (não religioso)

ID	Como se sente neste momento?
1	Sinto - me um guerreiro
2	Bem, mas cansado. Ombros tensos
3	Ansioso, nervoso, overwhelmed devido a baixa autoestima
4	Apático, Indiferente
5	Sinto me bem, stressado por causa dos exames
6	Sinto me um pouco cansada do dia, com um bocado de frio e também um pouco ansiosa das coisas que tenho para fazer.
7	"- Idealização de um mundo melhor mas com noção do possível fatalismo da ideia - Querer deixar uma marca mas ao mesmo tempo achar que não sou capaz - Turbilhão de emoções e sensações com as quais ainda estou a apreender a viver, a descobrir - Dores física sporque decidi treinar, o que já não fazia à algum tempo - Cansada mas com esperança Ainda estou num processo de tentar perceber o porquê de me sentir assim e ter todos os pensamentos que me assombram "
8	Sinto-me com medo. Medo do que vem. Acredito que tenho uns bons ideais e pensamentos a percorrer a minha mente, mas falta certeza do futuro. Sinto que esse medo não me faz viver o presente.
9	Nostalgia, entusiasmo, amor, incerteza, frio, dissociação, ansiedade, esperança. Estou num sítio a que já não venho há anos, estou com um amigo que já não vejo há anos e de quem tenho saudades. Não tenho tanto tempo como gostaria de ter e tenho de ir embora daqui a pouco, por isso quero aproveitar ao máximo.
10	Calma no geral, entusiasmada, curiosidade. Calma porque acordei bem e foi um dia de folga a fazer o que gosto de fazer e dá para ouvir os sons da experiência ao longe o que me faz sentir curiosidade
11	Bem, nostálgico, em comunidade, ligeiramente nervoso, aceite
12	Descontraído, curioso, paciente, relaxado e pensativo.
13	Força, vontade. Energia para me transformar. Energia para despertar o mundo
14	Calmo e sereno, mas um pouco cansado fisicamente
15	Expectante, curiosa, entusiasmada
16	Ansioso, aberto à recessão, euforico
17	No presente momento sinto-me calmo e tranquilo, sem grandes preocupações ou frustrações.
18	Sinto me cansado e com stress porque tive um dia muito cansativo e ainda tenho muito que fazer
19	Sinto me em paz e harmonia com tudo o que rodeia
20	Preocupação e ansiedade pelo estado atual do ambiente político mundial, do estado do planeta terra e da ignorância política em relação ao assunto, conjugado com situações de saúde de familiares entre outre outros motivos académicos e pessoais. Porém, sinto felicidade sem razão aparente, possivelmente relacionada com alguma positividade característica da minha pessoa e da ausência de males maiores no meu estado de saúde física, mental e social.
21	Calma e feliz, porque sinto que estou a alcançar os meus objetivos e a minha autonomia e confiança
22	Sinto me feliz e agradecido por estar aqui estar presente. Sinto me ansioso e um pouco stressado. E cansado também

ID	Qual a sua perspetiva sobre a humanidade e a natureza?
1	Acho que a humanidade faz parte da natureza
2	A primeira está contida na segunda, por mais que o modo de vida de boa parte do contingente humano se tenha afastado das conexões primais ao meio que habita.
3	Que um dos motivos que nos torna humanos é a capacidade de experienciarmos a natureza e o mundo envolvente
4	Sobrevivência. Procura de significado
5	Tem uma evolução interessante desde que éramos primatas até onde chegamos à atualidade. E interessante pelo facto de vivermos todos sobre regras e limites compostos por nós mesmos
6	Acho que nos fazemos parte da natureza mas existe uma separação grande.
7	Acredito que estamos a perder contacto com a natureza e a esquecer que também fazemos parte dela. Idealizámos um conceito de superioridade sobre a mesma no entanto continuamos a ser guiados por ela
8	Acredito que não existem mecanismos claros na sociedade que nos permitem uma maior conexão com a natureza. A natureza parece ser um escape da vida que a sociedade projeta.
9	Sinto que a humanidade tem uma ideia de posse e intitulação sobre a natureza, uma ideia errada. A maneira como dividimos os dois é arbitrária e centrada nas ideias da nossa cultura e do nosso tempo. Na minha opinião, a linha é muito menos nítida, a natureza e a humanidade são um só, nós não mais nem menos que ela.
10	A humanidade faz parte da natureza e interage com ela (a natureza tem muitas formas e maneiras de se expressar)
11	A humanidade faz parte da natureza. A natureza é um conceito algo esotérico, pode ter vários significados. A humanidade em si já é algo mais objetivo, refere à espécie humana.
12	Forte elo de ligação. Sem a natureza a humanidade não seria melhor.
13	A sua ligação é conexão à divindade
14	A humanidade e a natureza são um só. São a simbiose primordial e ancestral da nossa existência . A conexão divina.
15	"Fé, sensibilidade, inclusão, interacção, o todo pelo individual e o individual pelo todo. Somos apenas e também um pedaço universal."
16	"A humanidade é um produto da natureza A natureza é mais complexa do que imaginamos e podemos ver A humildade é complexa, mas bastante menos complexa que a natureza"
17	Devem ser respeitadas e admiradas, cada uma à sua maneira, preservar e proteger são as palavras chaves para a natureza, a humanidade por outro lado deve ser vista com mais cautela, também com admiração mas sem confiança total mas tentando sempre a via da educação.
18	A natureza para mim são fenómenos são locais são seres vivos são padrões e formas, transmite calma e harmonia e parece ser prefeita a humanidade esta muito ligada com a natureza e acho que é dependente dela
19	Acho que houve um grande distanciamento dos humanos em relação à natureza nos últimos 30 anos. Mas agora vejo mudanças de comportamento e maior consciência do ambiente e logo de nós mesmos.
20	Creio que a humanidade e natureza devem existir de forma simbiótica. O ser humano faz parte da natureza e a natureza parte essencial á vida do ser humano, um não deve prejudicar o outro. Porém a natureza não é dependente do ser humano e consegue prosperar na ausência dele.
21	A natureza é tudo o que nos rodeia e sem esta não conseguíamos respirar, comer e viver
22	Humanidade e natureza na minha perspetiva estão interligados incondicional. A humanidade somos todos nós é de certa forma o conceito que nos conecta como seres humanos da mesma forma que a natureza nos conecta também com os seres humanos mas todos os seres vivos.

ID	O que entende por "experiências místicas" ou "estados alterados de consciência"?
1	Nada
2	Experiências carregadas de significado para o sujeito que podem ser (ou pelo menos parecer) metafísicas em sua natureza. O estado alterado de consciência poderia ser uma descrição a se aplicar ao estado de alguém que passa por uma experiência do tipo
3	Experiências transcendentes ao estado habitual de pensamento, com padrões de pensamento diferentes do comum
4	Explicar o que não entendemos. Procura por um significado
5	Não entendo
6	Para mim experiências misticas são experiências dificeis de explicar que se tem de maneira consciente. Estados alterados de consciência para mim são estados fora do normal (dia a dia) alcanzados através de meditação ou uso de substâncias
7	Talvez viagens no nosso inconsciente que nos tenta dar mensagens para novas possibilidades
8	Essas experiências são como uma realidade alternativa à realidade banal. E experiências alternativas trazem-nos sabedoria, pois vivenciamos acontecimentos que o nosso cérebro não conseguia reproduzir.
9	Sensações de prazer dissociado da realidade, momentos meditativos que nos dá a possibilidade de nós entendermos melhor a nós e aos outros, mas ao mesmo tempo uma forma de nos separarmos e individualizarmos.
10	Experiência mística é uma experiência fora do que se considera logicamente possível e estados alterados de consciência um estado em que consegues experienciar mais do que a informação que os teus 5 sentidos físicos conseguem captar na tua interação com o ambiente
11	Estados alterados de consciência são todos os estados em que uma pessoa não está sóbria ou com algum problema de saúde que afete a sua psique. Experiências místicas são um conceito criado pela humanidade para explicar fenómenos ou experiências que não conseguem descrever ou justificar com conceitos materiais.
12	Algo que nós, humanos, não temos total controlo. O que nos pode alargar horizontes e fazer passar por experiências novas.
13	São momentos em que a nossa consciência se expande, que conseguimos "olhar" para o nosso interior e Sentir tudo o que há dentro de nós e à nossa volta.
14	Experiências transcendentais que nos conectam com o divino em nós e que nos rodeia.
15	Permissão para experiência algo que não estamos tão dusponiveis no quotidiano, mas que nos dizem muito de nós próprios
16	Ativação ou alteração de partes do nosso cérebro
17	Sensações e experiências que nos colocam com diferentes perspectivas sobre nós, a vida em geral, o mundo e a humanidade. Auto-conhecimento e descoberta de outras dimensões do ser humano e da sensibilidade com que vemos o mundo.
18	Estado de consciência em que não estamos frequentemente em que a nossa perspectiva pode variar de pessoa para pessoa
19	Algo fora da nossa percepção comum, algo mais para além da realidade normal. outras dimensões.
20	Momentos em que um indivíduo consegue experienciar pensamentos, sentimentos e emoções que não conseguiria num estado de consciência normal do dia a dia
21	Remete me para uma experiência relacionada com algo espiritual e o contacto com algo divino
22	Experiência que interferem diretamente com a nossa geral percepção do estado de realidade habitual.

ID	Descreva o que experienciou	Mudou algo na sua maneira de percepcionar o mundo?
1	Confusão	Não
2	vida, elementos que transmitiam uma ideia de coisas vivas. Água, sementes, mãos, penas, garras, células, folhas, luz, padrões, circulação – e, principalmente, ciclos	Não
3	tranquilidade, harmonia, calma	Talvez
4	espiritual, natureza, pacífica, relaxante	Talvez
5	Mistério, suspense, incógnitas de pensamento	Não
6	Paisagem sonoras, projeções, calma/pausa	Talvez
7	Calma, tranquilidade, renascimento, conexão com o mundo	Sim, para melhor
8	Respirar, calma, ritmo, paz, vibrações, geometria, nascimento, natureza, ramificações, visuais, música	Não
9	Espiritual, calmo, ansioso, dissociado, separador, refletor, interiorizador, misterioso, arrepiador	Sim, para melhor
10	Uma experiência meditativa	Talvez
11	Unidade, cooperação, interdependência, simbiose	Talvez
12	Natureza, transformação, movimento, formas, aleatoriamente, sensações	Sim, para melhor
13	Viagem, meditação, conexão, poder	Sim, para melhor
14	Simbiose	Sim, para melhor
15	Esperança	Sim, para melhor
16	Reflexão, tristeza, calma, consciência, solidão, imaginação, transporte para outro lugar	Talvez
17	Tranquilidade, paz, sossego, mistério, desconhecimento.	Talvez
18	Tranquilidade, serenidade calma,suspance,paz,entusiasmo,felicidade , satisfatório, satisfação ,gratitude surpreendido e espantado	Sim, para melhor
19	Calma, bem estar, paz, conexão	Talvez
20	Universo, solidão, nostalgia	Talvez
21	Relaxada, focada no presente, curiosa	Talvez
22	Emerssivo, passeio, relaxante, intrigante, emocionante.	Talvez

ID	O que mudou?
1	
2	Nada mudou por ter funcionado como um indicador para algo em que eu já acreditava, o que pode ter levado a minha impressão a ser muito diferente da de outros testers.
3	
4	Momentaneamente voltar ao presente.
5	
6	Mudou a minha maneira de experenciar o espaço a minha volta
7	"Aceitar que nem tudo está ao meu alcance para melhorar, que é preciso saber aceitar a beleza do que temos. Também de certa forma fez-me sentir em paz com a morte. Sentir verdadeiramente que todos fazemos parte do ciclo da natureza e que nada desaparece por completo, apenas é absorvido em novas formas "
8	
9	Tenho esperança que as pessoas que serão o nosso futuro terão um melhor entendimento delas próprias e um melhor entendimento dos outros, para que possamos realmente começar a mudar a perspetiva da humanidade para o melhor e não antagonizarmos nem explorarmos os outros e a natureza.
10	O meu foco interno passou dos pensamentos às emoções
11	Fez com que surgissem sentimentos que quando estou em momentos de grande stress esqueço. Que somos todos humanos e estamos cá uns para os outros. Temos uma experiência subjetiva mas temos todos sentimentos e dores comuns. Por mais diferentes que sejamos, encontramos sempre alguma forma de darmos "relate" com a experiência de cada um. Como tal, devíamos trabalhar juntos e não dificultar a vida uns dos outros. Pois isso, por sua vez, vai acabar por, de forma indireta, afetar a nossa vida.
12	A perspetiva como olhos para certas coisas, mas, principalmente, relembrou-me que estamos cá de passagem. Que tudo se transforma e nada é certo!
13	Trouxe-me para o momento presente, o Agora
14	Presença
15	Ter ainda mais esperança, que através dos sentidos e do apelo aos sentidos, nos podemos sentir mais parte de um Todo
16	Não sei explicar
17	Sinto que é cedo para conseguir dizer ao certo se realmente mudou, mas o princípio da mudança é o pensamento e isso (não mudou), apenas veio reforçar a ideia de que a natureza deve ser vista e aproveitada de uma forma melhor e que muitas vezes os problemas reais não são tão relevantes.
18	A minha percepção de gratidão por pequenas coisas, notei que simplesmente com alguns padrões conseguia sentir me presente grato e calmo
19	A interação com o meio ambiente e a consciência
20	Não consigo responder de forma acertiva á pergunta. Porém posso afirmar que proporcionou um momento de calma e reflexão.
21	Talvez me tenha feito pensar que é importante estar mais atenta ao que está à minha volta e viver o presente com maior tranquilidade. Parar para respirar
22	Sinto que possivelmente a experiência seja muito curta para alterar a maneira de percepção do mundo. É tudo muito momentâneo. Possivelmente as imagens, experiências e perspectivas que visionei na atividade vão me impactar e certamente vão me fazer pensar. Mas não ao ponto de mudar a perspetiva do mundo sendo que a maneira de percepcionar o mundo é muito vago e abrange muitas diversas areasy

ID	Como se sente agora?
1	Guerreiro, tal como antes
2	Mais relaxado, devido ao exercício de respiração e ao "break" + ambience + tempo de reflexão proporcionados pela segunda etapa. Os sons e animações sugerem tópicos de reflexão que muitas vezes nos fogem no dia-a-dia, e por isso conseguem "quebrar" o fluxo normal de pensamento e prender a nossa atenção
3	Mais calmo, menos overwhelmed e ansioso, e com uma esperança renovada para o dia de amanhã
4	Mais relaxado. Pequenos momentos que fazem aproveitar o presente são essenciais para criar momentos de pausa na daily grind routine do trabalho
5	É um mundo cheio pensamentos e sentimentos estranhos
6	Sinto me mais calma, porque tive um momento de pausa e apreciação
7	Calma, mas sempre cheia de dúvidas e questões
8	Sinto-me mais presente e mais calmo.
9	Com esperança, novamente com saudade e nostalgia, quero voltar aos dias mais simples mas sei que não posso, mas quero e vou aceitar os dias de hoje e fazer para um futuro melhor para mim e para os outros
10	Senti as emoções a sobrepor às observações permitiu desligar dos pensamentos. Porque está organizado como uma experiência meditativa, penso que qualquer pessoa com experiência a meditar conseguia tirar alguma coisa
11	Contente, empático, calmo, em paz, com vontade de ajudar e fazer melhor
12	Sinto-me mais vivo e mais consciente, apesar de que no processo abstraí-me bastante da realidade. Apenas porque me fez pensar na vida.
13	Consciente, presente, tranquila, em paz
14	Conexão, presença e serenidade
15	Sinto-me mais introspectiva, mais realizada, porque me permiti usufruir de um momento para mim mas que me fez sentir parte de um humano comum.
16	Calmo, pouco confiante, atrapalho,
17	Sinto-me bem, mais relaxado que antes de ter começado a experiência. Com vontade de continuar a ter experiências no mesmo ambiente.
18	Sinto me calmo porque todo o ambiente e som nos proporciona esse sentimento para além disso ao ver as projeções senti espanto e satisfação na prefeicao em como as formas se criavam passavam e desvaneciam por isso agora sinto de alguma forma uma satisfação e impressionado
19	Em paz
20	Em comparação com o início do questionário sinto-me mais calmo e com as ideias mais organizadas. Os sentimentos mais fortes de alguma preocupação ou ansiedade não se alteraram significativamente porém a forma de os encarar parece diferente.
21	Agora sinto me tranquila, sinto me mais em contacto com o meio à minha volta. Longe do stress e do caos do dia a dia.
22	Mais relaxado. A experiência permitiu me focar no momento presente. Especialmente depois de um dia estressante. Gostei como alguns minutos me conseguiram fazer estar em sintonia comigo mesmo. E gostei de ter algum tempo com os meus pensamentos para apreciar e interpretar algo.

ID	Quais destes conceitos encontrou expressados na instalação?
1	Fractais / ramificações
2	Fractais / ramificações, Emergência, Biomimética, Místicismo, Meditação, Psicadelismo, Harmonia / Frequências, Shamanismo
3	Fractais / ramificações, Místicismo, Meditação, Psicadelismo
4	Fractais / ramificações, Rácio de ouro, Biomimética, Meditação, Harmonia / Frequências
5	Fractais / ramificações, Meditação
6	Fractais / ramificações, Rácio de ouro, Teoria de Gaia / Holismo, Meditação, Psicadelismo, Yin-Yang / Balanço
7	Fractais / ramificações, Meditação
8	Fractais / ramificações, Geometria Sagrada, Místicismo, Meditação, Psicadelismo, Harmonia / Frequências, Yin-Yang / Balanço, Shamanismo
9	Fractais / ramificações, Emergência, Não-dualidade, Místicismo, Meditação, Psicadelismo, Harmonia / Frequências, Yin-Yang / Balanço, Shamanismo
10	Fractais / ramificações, Biomimética, Não-dualidade, Místicismo, Meditação, Psicadelismo, Harmonia / Frequências, Yin-Yang / Balanço, Shamanismo
11	Fractais / ramificações, Rácio de ouro, Geometria Sagrada, Emergência, Biomimética, Não-dualidade, Meditação, Psicadelismo, Harmonia / Frequências
12	Não-dualidade, Meditação, Harmonia / Frequências
13	Fractais / ramificações, Meditação, Harmonia / Frequências, Shamanismo
14	Fractais / ramificações, Rácio de ouro, Geometria Sagrada, Teoria de Gaia / Holismo, Não-dualidade, Místicismo, Meditação, Psicadelismo, Harmonia / Frequências, Yin-Yang / Balanço, Shamanismo
15	Fractais / ramificações, Geometria Sagrada, Emergência, Biomimética, Meditação, Harmonia / Frequências
16	Fractais / ramificações, Emergência, Meditação, Psicadelismo, Harmonia / Frequências
17	Fractais / ramificações, Geometria Sagrada, Místicismo, Meditação, Psicadelismo, Harmonia / Frequências, Yin-Yang / Balanço
18	Fractais / ramificações, Emergência, Biomimética, Místicismo, Meditação, Psicadelismo, Harmonia / Frequências, Yin-Yang / Balanço, Shamanismo
19	Fractais / ramificações, Geometria Sagrada, Psicadelismo
20	Fractais / ramificações, Meditação, Psicadelismo
21	Fractais / ramificações, Meditação, Harmonia / Frequências, Yin-Yang / Balanço
22	Fractais / ramificações, Geometria Sagrada, Meditação, Harmonia / Frequências, Yin-Yang / Balanço, Shamanismo

ID	👁	👂	✋	Porquê?
1	4	6	1	
2	7	6	1	As imagens e sons definitivamente sugeriam vários dos conceitos listados. Apesar de ter imaginado que pudesse haver interactividade, estar com outra pessoa durante a experiência me fez não querer tentar interagir com movimentos ou sons. Se estivesse sozinho, talvez tivesse tentado.
3	7	7	2	
4	6	7	4	"O sound design estava bastante imersivo. No entanto, crescendo em ambientes mais florestais e de serra, penso que outras pessoas mais ligadas à costa e ao mar podem sentir lacking de sons como o mar: https://www.google.com/amp/s/www.nbcnews.com/better/amp/ncna787231 O visuals estavam cativantes mas não overstimulating. Só reparei que uma das peças da exposição interagia com o som quando me foi indicado."
5	5	7	3	
6	7	7	4	A parte da interatividade não notei muito onde estava ou de que maneira ativava/mudava o espaço
7	6	6	5	No geral gostei muito da dinâmica da instalação, mas gostava que tivesse uma manta na segunda parte tal como na primeira de forma a sentir-me mais terrena
8	7	7	4	A estética e o som fazem com que chegue aos conceitos acima enumerados. Em relação à interatividade, não consegui achar muita. Mas percebo que devido a não haver iluminação, fosse difícil capturar a imagem, então percebo que fosse limitada até certo ponto .
9	6	7	6	O design de som estava excelente, deixou-me perfeitamente emergido na experiência. Achei que o que "tinha" de fazer, ou que era esperado de mim, não era tão intuitivo como poderia ser, mas também percebo que isso era um bocado o ponto
10	7	7	1	Falta uma questão em relação à interação com o espaço. É preciso assinalar melhor o caminho de maneira a conseguir observar todas as instalada
11	7	7	7	Da minha perspectiva a instalação alcançou o seu propósito tanto os visuais como o som ajudaram a reforçar os sentimentos de unidade que senti. O facto do som e visuais estarem ligados reforçam ainda mais este sentimento de uniam e sinergia entre tudo.
12	7	6	6	Gostei bastante da experiência, e sinto que o local ajudou imenso na mesma.
13	5	7	4	Falta de cores. nao percebemos a interatividade. Excelente escolha de musicas, sons da natureza muito bem integrados com os 4 elementos e excelente ligação visual multimédia.
14	7	7	6	Tudo harmonioso, inspirador e envolvente. Queria mais 🙂
15	7	7	7	A luz, os sons, o cheiros e a envolveria criada... "abraçaram-me"!
16	5	5	6	"A primeira instalação gostei, permitiu-me relaxar e pensar um pouco, contudo achei demasiado simples e não me consegui concentrar durante muito tempo. A segunda instalação foi a que menos gostei, pois apesar das diferentes imagens que iam aparecendo e da musica, nada me cativou, sendo que me pareceu apenas uma extensão da primeira instalação. A terceira instalação foi a que mais gostei, pois absorveu o meu pensamento e a estética era ótima. Também ajudou o facto de me ter sentado no chão. Senti-me transportado para outro lugar."
17	7	7	5	Não diria que estivesse alguma coisa "mal". Todo o ambiente foi muito envolvente e bem escolhido na experiência. O som juntamente com as imagens culminaram num misto de sensações. Levaram-me a outra "dimensão" momentaneamente. Apesar de sentir que por vezes me distraía e que não conseguia estar 100% focado, no entanto, diria que essa questão é algo que me compete mais a mim melhorar. Toda a escuridão e natureza do ambiente contribuíram muito para a experiência.
18	7	7	5	Gostei imenso do ambiente e de como tudo estava montado gostei ainda mais do som que complementa o ambiente prefeitamente e que tem interação com os visuais projetados porém esses foram os unicos indícios de interatividade que eu encontrei
19	5	7	3	Gostei muito do ambiente e do cenário, o som é as imagens que permitem viajar na mente.
20	6	7	1	Não reparei na interatividade do espaço e portanto sinto que alguma da experiência possa ter ficado perdida nisso. O som e a escuridão conjugada com a luz da instalação deram um um ambiente muito envolvente e reconfortante
21	6	7	4	Na minha opinião, o facto de o som estar em sintonia com as imagens e a calma transmitida permitiu me estar mais concentrada e dentro da experiência
22	6	6	3	Reparei na interatividade do primeiro mas não nos seguintes. Talvez pudesse ter sido mais bem guiado ou mais contexto tivesse sido dado

Technical rider

Item	Technical notes
PC 1 - Laptop └─ Power cable	Running TD non-commercial
PC 2 - Desktop ├─ Power cable ├─ Keyboard └─ Mouse	Running TD educational >3m in length
Soundboard └─ USB to USB-C cable	Sound board for *System B* output and *System C* mic input
Studio monitor speaker ├─ Power cable └─ XLR to Jack cable + extension	Left speaker of *System B* >3m in length >15m in length
Studio monitor speaker ├─ Power cable └─ XLR to Jack cable + extension	Right speaker of *System B* >3m in length >15m in length
Microphone ├─ Jack cable └─ Wind filter	High sensitivity, condenser mic >10m in length
Portable Bluetooth speaker x2	Sound for *System A* and natural ambience
Projector 1 ├─ Power cable └─ HDMI cable	For *System A* >5m in length >10m in length
Projector 2 ├─ Power cable └─ VGA cable	For *System B* >5m in length >10m in length
Projector 3 ├─ Power cable └─ HDMI cable	>5m in length >10m in length
Kinect v1 └─ USB extender	Using depth mode >5m in length
Hanging mobiles x6~	should use local materials
Lights ├─ Candles ├─ Fairy-lights └─ UV light	need a glass cup protection, extinguisher nearby battery powered were used
Banners x2	
Extension cable x3	The cable lengths above may need extensions depending on the space

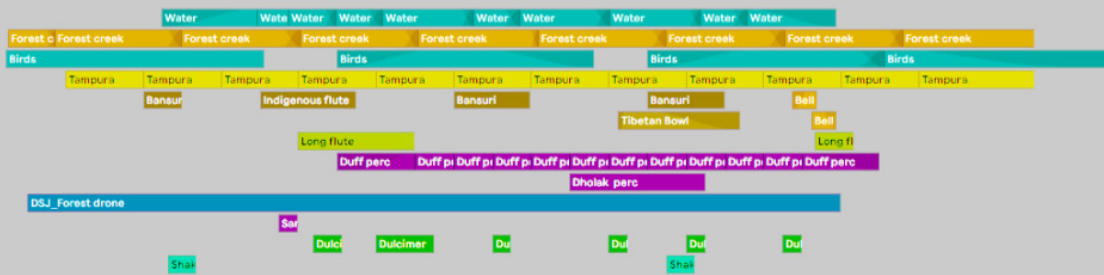# Soundtrack compositions
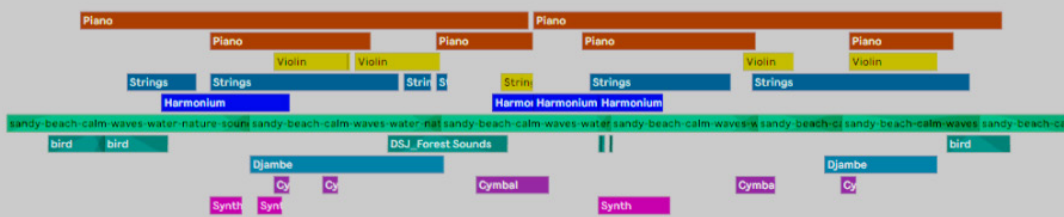

Grounding
03:20

Mytsical
06:32

Om
06:15

Pan

03:46

Peace

03:36

Shamanic

06:20

Sounds used

harmonic-resonance.com/collections/loop-and-samplepacks/products/deep-shamanic-journeys-standard-edition-loop-and-sam-plepack-ableton-live-template

ia800206.us.archive.org/7/items/16ICAROSCHAMANICOSAyahuascaCantosForTravelInAyahuascaCeremonies/16ICAROS%20CHA-MANICOS%20-%20Ayahuasca%2C%20Cantos%20for%20travel%20in%20Ayahuasca%20ceremonies%2C%20____.mp3

quicksounds.com/sound/15437/heartbeat-slow

freesound.org/people/Amoek/sounds/393348/

freesound.org/people/LucaE/sounds/520575/

freesound.org/people/flood-mix/sounds/413325/

freesound.org/people/sunsinger/sounds/80844/

Fonts used

github.com/caiosimonbreda/grima

creamundo.com/en/cavebatsfour

arabicfonts.net/fonts/aayat-quraan_035-regular

fontineed.com/font/phoenician

fonts.google.com/specimen/Cardo

wfonts.com/font/hieroglyphics

Images used

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as1.ftcdn.net/jpg/01/04/25/44/220_F_104254422_KIQ8UOS9CE5MEVyjIkr4HGsnzRshPkFZ.jpg

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