

Thesis Report 2020

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# Perceiving Time

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## **SIDE NOTES**

1: Reference:

Phenomenology: Kortooms, A. J. M.  
(2002). *Phenomenology of time: Edmund Husserl's analysis of time-consciousness* (Vol. 161). Dordrecht, The Netherlands: Kluwer Academics Publishers.

2: a form of art where the artist uses a system, or a computer, which already has been given a set of rules to follow, or a particular language, which then results in making their its own complex art.

3: a form of animation where the story has its own patterns and movements, not following any given narrative or linearity as normal animations, can be subjective.

### 1.1 **KEYWORDS** -

Time, Definition of time, Time as Process, Visual Representation, Multiple Aspects, Space-Time Continuum, Einstein vs Minkowski, Relative, Limbo, Time Travelling, Phenomenology <sup>1</sup>, Circles, Mandalas, Wheel of Time, Comparative Religions, Interaction Design, Computational art, Generative Art, Coding, Experience Design, Experimental Animation, Abstractive

### 1.2 **ABSTRACT** -

Time is a string of moments where events occur continuously bringing together the concepts of past, present, and future. What started off with interest in phenomena such as time travel, black holes, and how time works, slowly changed its course by looking into the concept of time itself in one's everyday life. Researching about time through mandalas and other beliefs made me realize the crux of my project, how can I visually convey my understanding and representation of the theory of time. Keeping in mind the complexity of the subject itself, I have come to the conclusion that time is a very relative concept on its own. Each individual can experience it very differently, as Albert Einstein himself said "Time and space are modes by which we think and not conditions in which we live."

I seek to answer my question by exploring and studying different aspects of time. It is a word that can be looked at from multiple perspectives, scientific, philosophical, even magical. My project revolves around understanding a simple term, and forming visuals which are fusing together to highlight certain details, which will bring out the essence of time.

### 1.3 **PASSION** -

I have always been inquisitive about certain things that do not have one proper answer, such as the idea of time itself. It is a term that is known to everyone, but would be subjective to every individual. What really fascinated me since I was a child was how time would look. Does it have a face? Is it associated with a colour? I grew up with an image of an analogue clock in my head, but as I read more, the image in my head expanded, until it wasn't a whole picture, but a collection of small thumbnails which were not explaining the subject as a whole. I took it as a challenge to find out even more about the stories of time.

### 1.4 **PROJECT SCOPE** -

My project aims to highlight the key idea of time which can be understood on multiple levels by people in general. Being both an abstractive and a universal term, my project lives to broaden the minds by making them question their understanding as opposed to mine, as subjectivity is an ever-present tool that would help me understand my project even more so by the help of different perspectives. I have only but scratched the surface of such a complex theory, but with the research that has been attained, I want my project to relate to my audience on different levels.

### 1.5 **DESIGN STATEMENT** -

In order to express the intricate ideas of time I chose Generative Design<sup>2</sup> as a tool for my project. My research has an interactive aspect that enables the audience to play around with the visuals I provide. They will not only absorb

4: Simpson, J. (1991). *Is Time a Circle or a Straight Line? Art Education*, 44(4), 43-46.  
doi:10.2307/3193283

the concept and the information, but have the power to give an output of their own perspective. Though they have been given a tool to make a change in the given works, the computer or the phone screen acts as a canvas, which enables the audience to paint, or make marks, such a tool which automatically heightens their interest. This simple use of the pen goes beyond the usage of it, but it leads down a path of understanding the idea behind it all. Why was it created? What is it representing?

My visuals have been created with the coding software of Processing 3+, using basic shapes such as circles, squares, and rectangles into different visuals all of which highlight a different theme. The visuals have one thing in common, which is the emotion of relief, which is truly needed for everyone during this very difficult time. By dabbling into experimental animation<sup>3</sup> and coding, I try to bring out a digitized meaning of time which can be accessed remotely and can work for anyone anywhere with just the use of a screen, whether computer or phone, hereby heightening the importance of time which has been spent by the audience who are playing with the visuals.

#### 1.6 **TARGET AUDIENCE** -

I do not have a particular audience for my project. My project aims to be a beacon for all who wish to spend their time on understanding and enjoying different interactive visuals of time itself. My project can be taken as a way of relieving stress itself, or one can dig as deep as they can, it depends on the user entirely.

## **Chapter 2**

### **2.1 RESEARCH QUESTIONS -**

- 1: How can I use circles to visually depict my understanding of time?
- 2: How can time be characterized as an integral concept to an individual's everyday lives?
- 3: How many ways are there to define a vague and abstract term such as Time?
- 4: Does time run in a loop?
- 5: How can I make my understanding of time simple enough to be suitable for children?
- 6: How can I visually convey my understanding and representation of the theory of time?

### **2.2 THEORETICAL FRAMEWORK -**

5: Kuhn, R. L. (2015, December 23).  
Confronting the Multiverse: What  
'Infinite Universes' Would Mean.  
Retrieved from  
<https://www.space.com/31465-is-our-universe-just-one-of-many-in-a-multiverse.html>

Time has had a lot of research done on it, religiously and scientifically. With the Term itself having more than one definition, it can also be made clear that there are various ways to perceive it as well. Time has many different articles written on it, and its several aspects, trying to work out how it occurs and events come to pass. There have been many articles and perceptions, and most of them have not been proven as yet. Some of the most famous questions that I have come across are about the actual shape that time itself may have<sup>4</sup>. And

References:

1: SCOTT, T., & POWELL, J. (2018).

*The Universe as It Really Is: Earth,*

*Space, Matter, and Time.* NEW

YORK: Columbia University Press.

doi:10.7312/scot18494

2: Howell, E. (2017, November 14).

*Time Travel: Theories, Paradoxes &*

*Possibilities.* Retrieved from

<https://www.space.com/21675-time-travel.html>

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2: Jenkins, S. (2012). *Time and*

*Personal Identity in Nietzsche's*

*Theory of Eternal*

*Recurrence.* *Philosophy*

*Compass*, 7(3), 208–217. DOI:

10.1111/j.1747-9991.2011.00473.x

there are many different academic theories that offer various opinions. Some of the most important theories that stood out for me are Einstein's Theory of Relativity, the Cyclic Universe Theory, Eternalism, and the multiverse hypothesis. One thing all must understand is that time has an arrow, where it follows a certain path, for it does not flow out everywhere. Time manages to go forward, not backward, for example you can grow a tree, but the tree will not go back into its seed, which makes it certain that time indeed does have an arrow of direction that it follows. Einstein's research has shown the possibility of time traveling, although the speed should be as fast as light's, and only possible to happen if one goes to the future (which in my opinion, everyone is already doing so).

One thing to take away from Einstein's theory is that time is directly woven in as a dimension alongside space, and they both are very closely related to one another in their workings, hence the relativity. As opposed to this, Newtonian law clearly states as time not being a relative force, but an absolute one, which is also fundamental to the workings of the universe, otherwise it wouldn't have grown at all. Eternalism tends to differ here, as it believes that there is no past, present or future, but one point in time that we all will continue to live in (not to be confused with the Eternal Return or the Cyclic Universe theory) It negates the idea of time being a physical force which is present in the universe, and goes against the actual events of the Big Bang too. It contradicts the ideas of the Big Crunch, and the Big Freeze, where the universe will stop expanding and collapse within itself, ending everything automatically.<sup>5</sup>

In contradiction to Eternalism, comes the idea of the repetition of time, through the concept of Eternal Return, where phenomena such as time and space repeat themselves infinitely. Friedrich Nietzsche challenged many theories in regard to this one, especially considering how the Eternal Return has appeared in many ancient religious texts.



### 2.3 **VISUAL REFERENCES -**

Visuals have been one of the most important factors of my whole project, considering my research question revolves around it. I took into account all the movies and television shows that I had watched, as well as look into artworks that had any direct or indirect concept of time itself. This includes everything from Back to the future to NASA's photography of space itself. I even took some inspiration from Alice through the Looking Glass, and the Time-Turner from Harry Potter and the Prisoner of Azkaban, mainly because they depict the changes of time in their own way. Dark's caves and the Apparatus was highly interesting to look at as a visual, because mainly no one knows what any of the components are, but it fills a blank piece of the puzzle in your mind as to how the characters managed to travel freely. Disney proved to be a great reference in terms of showing years, or seasons, through the environment and the characters, one example could be taken with Sleeping Beauty and the visual depiction of the castle after it is put to deep sleep. Visual references can also include different installations, such as Anthony Howe's kinetic sculptures.

### 2.4 **LITERATURE REVIEW -**

My research started in the first phase of my journey, which was my inspiration, time-traveling\*. Keeping in mind such a phenomenon, there have been many movies and books that one comes into contact with since their childhood, and

*\*The phenomena of traveling through time to the past or the future.*

5: Dirac, P. A. M. (1996). *General theory of relativity*. Princeton, NJ: Princeton University Press.

offer a lot of information about time travel. I started to pour over various movies and novels in order to get a firmer grasp of this term and understand its different concepts. Doctor Who, Harry Potter, and the Back to the Future series were some of the first movies I looked into, alongside H.G Wells' 'The Time Machine', and 'The Sleeper Awakes'. They paved a pathway for me and my work branched out further as I pointed out keywords which took my research even further. I categorized different ways to time travel, and more movies came into light, such as Looper, Primer, The Amazing Adventures of Bill and Ted, etc. This broadened my mind as I began to search into the science of black holes, wormholes, multi universes. The turning point came when I came across the German Tv show Dark, which introduced a new way of time traveling to me, alongside the 33-year cycle theory. There aren't many novels or theories which can account for the way time works and give explanations as to how time travel can be possible

. Alongside this, the research that made me come across is Jessica Stanley's 'Time Travel'. Another work which can be looked into is Lee Broom's work of the same name. Both of these artworks indicate two different ideas of the same topic, the former, which had a concept of interacting with different colours and typography, giving the idea of time traveling from room to room, and the latter, with Lee Broom's Installation using furniture and everyday objects in a carousel form in the middle of an empty room. Jack Brostup's series of paintings called 'Passage of Time' indicate the different ages a particular place may have gone through, giving a very magical and mysterious feel, as if one is replaying a dream in their mind. One of the famous paintings which many have observed is Salvador Dali's 'The Persistence of Memory'. It literally shows melting clocks which, for a visual, stood out to be a very strong one for me in this particular regard.

As my research progressed, I stepped back and focused on the term of time. There were many different artists who had produced different works, one of

them being ‘Untitled’ (Perfect Lovers), by Felix Gonzalaz-Torres. This has a very interesting take on time, as it talks about how like clocks, people can fall out of sync over time. There have been many large-scale exhibitions which have name due to their festive and mesmerizing vibe. Lance Garber’s ‘Night self-portrait Birdseye Sunrise’ was an installation held during the Coachella Music and Arts Festival, which served as a resting area by day and a lit-up artwork at night, making use of backlit circles and bright lights. This made me realize how a project does not necessarily have to be a product, or a publication, but it could just so easily be an experience that the audience scrutinize. In order to see the types of work being done around the world, one must never limit themselves to studying only on one medium, hence I began to read about a lot of different means as well as the work being expressed by many individuals. One such work that stood out for me was ‘Portal to another Dimension’, by a German artist, 1010. His paintings weren’t the usual contemporary ones, but a particular type of graffiti that could show depth and give a three-dimensional opening to an unknown space. The Artechouse presented a show on Parallel Universe in 2018, which is another example of experience designing. After looking at a lot of these examples, my understanding of time began to shift, as my project would seem to be explained better in interactive arts rather than just still images. Keeping that thought in mind and researching even further, i realised that the word art, can very well include photography, and one can read into how the images were taken. Balint Alavits, ‘Time Machine’ is a work that depicts photographs of different staircases, taken with such a frame that most of the pictures represent the same opening of a portal, just as 1010’s work did, however differently.

Klinkert, T. (2018). *Historical Time, Cultural Time, and Biological Time in Baudelaire. Biological Time, Historical Time, 180–195. doi: 10.1163/9789004385160\_013*

Keeping in mind the different theories in place regarding time, one needs to realize that time can be taken in many different forms, physical time, psychological time, biological time etc. Albert Einstein talks about physical time, when he gives out his Theory of Special Relativity<sup>5</sup>, where he states that

physical time, is a relative dimension as compared to Hermann Minkowski's theory. He discusses about how time becomes slower or faster as it passes by according to the speed or the state of the individual, for example, if he is walking fast and covering more space, time automatically will go by slower as compared to when he is walking slower, which would result in the opposite. Einstein also takes into account the crucial role of the gravitational force that automatically makes time go slower wherever it is spread out. This particular debate managed to give me even more abstract ideas as to how time can be visualized.

Going forward, as my ideas progressed, so did the execution of my entire project. When searching for different mediums, the one that caught my eye was generative art. The first work that stood out to me belonged to John and James Whitney, who produced generative designs back in the 1960s, keeping in mind the simplicity of the computers then, their visuals were extremely enthralling, hinting a bit of experimental animation as well. They weren't showing a particular object, or story, but using random shapes. Their work then followed on till I came across Ballio Chan, who is a generative designer, using different coding software's to achieve the desired visuals. Evan Sutherland, an early interactive artist, was one of the pioneers of introducing interactivity digitally. This further shaped my idea into its final product.

*Park, G.-R. (2012). Japanese Experimental Animation in 1960s. Cartoon and Animation Studies, 29, 37–60. doi: 10.7230/koscas.2012.29.037*

## 2.5 CONCEPTS -

There have been many different historical and mythical contexts that I looked into as I was understanding time. I started off with a lot of interest in circles, which made me look into some sort of historical context of it. The circle's perfect shape, could be referred to as the Ouroboros<sup>8</sup>. As it first appeared in the shrines of King Tutankhamun, it is said to be one of the first symbols to appear, and alongside the beliefs of the Ancient Egyptians, the symbol represents the

*8: a circular symbol showing a snake, or a dragon, with its tail in its mouth like a circle, representing infinity and wholeness.*

Reference:

*The ancient symbol that spanned  
millennia. (2017, December 4).*

Retrieved from

<https://www.bbc.com/culture/article/20171204-the-ancient-symbol-that-spanned-millennia>

idea of eternity and endless return. The Ouroboros has been an essential part of my research, as to me it is one way of defining time with a circle.

Keeping in mind the circle shape, I looked into more religions, and came across the concept of Wheel of Time, (also known as the Kalachakra). It is a term found in many different religions and philosophies, such as Hinduism, Sikhism, and even Buddhism. It is a different approach from the Ouroboros, with the Hindu concept being called the Eternal Return<sup>8</sup>, they all essentially talking about the same thing, infinity. If one looks into the idea of the mandala, it talks about the cosmos being present in the entire circle. It is the perfect shape, with no faults, no corners to make it irregular. The Kalachakra has many different levels one has to achieve mentally and spiritually in order to be in the direct center of the universe, the stage of nirvana.

## 2.6 **RESEARCH QUESTIONS EXPLAINED** -

These research questions all are questioning the concept of time itself. What does it stand for people? With such an abstract concept at hand, the research aspect of it is the first step to understanding time. The first question is limited to a particular shape that I picked up along the way during my research phase. The circle holds a lot of importance in many theories and religions, for example Buddhism and Hinduism, and the idea of the Wheel of time, and the eternal return. For many, time itself is envisioned as a circle, something which keeps on recurring infinitely. I started out by keeping the perfect shape of the circle in my mind, setting it as a boundary, or maybe because I felt that the presence of a circle in nearly all of my visuals would automatically create a sort of narrative, or a journey.

The second research question is the idea of how universal the term time is. In this current age, time plays a crucial role in our lives, especially in a very mathematical way, in terms of hours, minutes, seconds, etc. my first opinion on it was the fact that everyone knows what time is, but do they? How much do they know? Would they like to know more? Taking this thought forward, i began to think of how over the course of many centuries, there have been many different opinions on how time actually works, and i have read up on some, but could there be even more? As a collective group thought or even individually?

The idea of using the particular word, Loop, in the question not only makes it specific to a pattern which time may be following, but makes time an endless and infinite force which may have the ability to go on forever. The loop gives off the idea of continuity, which then limits me to think of time through the Perspectives of Hindu, Buddhist and Ancient Egyptian beliefs even more closely than other religions and civilizations

This next question revolves around children, for unlike this project, I would have decided on a particular age group, and made a product which would not only be provided with fruitful information, but be fun for a child to happily learn. This question made me think of my project a step towards product designing, and understanding the psychology of that age of children.

Keeping in mind that my research questions have been ever developing, the last one proved to be the final question. It focuses on the idea that time will be visualized through my eyes and understanding, automatically making the project more personal and subjective, and yet, giving the audience to understand and learn from it too. The final question was not limiting or constricting me in terms of visual elements, or giving too much away, it was an open-ended question which leads the audience to think of the visuals as something beyond just the screen itself.

## **2.7 RESEARCH METHODOLOGY AND DATA SOURCES -**

Due to the nature of my project, my research has been mostly qualitative, that revolved around novels, movies, different theories, and articles. What does one really know about time? The main question was to get to know exactly how many people do have a perception of time already. Due to this very nature of the project, I chose secondary and tertiary sources of information to aid me in my journey, as I needed certified and available information before I started to work on my topic. I sent out surveys and asked around for some answers, and the answer came to, that nearly everyone was clear on how time works. My research was to understand the qualitative theories in order to take away any physical aspect or visual which can be useful. I did a small exercise in class where every student got a piece of paper, each having a random inkblot on the surface. They were given 15 minutes, on the whole, to interact with the paper however they seemed fit. This was the first step to how one visualizes and uses time at the same time. Most of them interacted with the inkblot, mainly because it already served as a starting point to them. This particular exercise helped me reach a point where I then decided to use interactivity in my final visuals as well.

## **Chapter 3**

### **3.1 EXECUTION: Brief Intro -**

My thesis execution idea has been evolving over time, and due to the current situation at hand, the physical display has been out of the question, hence we

have been limited to a virtual/ digital format for our final display for the time being.

### 3.2 **MEDIUM OF PRESENTATION**

The medium that I intend to use is through interactive design. This is but a simplified version of allowing the users to become part of the screen itself. They are given the mouse (or the screen, in the case of a phone) as a tool to change and alter the visuals to their own liking. The physical display had originally four different screens, with the tools being one of the two; i.e; a mouse tool (or touch screen), and a webcam tool, which adds interactivity and changes the visuals as you move or change your positions. However, in the virtual display, I'll be presenting a series of interactive visuals, one followed by another which are creating a narrative of fluidity in the shapes which we can regard as time. In this situation, the audience will be limited to using the mouse tool for playing with the visuals, but due to the widespread use of the internet, the visuals would be available more to play around and share.

### 3.3 **PRE - PRODUCTION**

I started off the visualization primarily by drawing out abstract visuals on Adobe photoshop, the initial visuals were roughly the shapes of mandalas and circles, different types of analog clocks, and watches. By trying to expand my horizons, my readings and research began to help me make more intricate images. I formed a specific template of a square format, with a 12x12 inch frame. I planned to make a narrative of about 50 images, depicting my journey with time itself. With nearly a month and a half, I realized that as a whole, my images were too subjective and abstractive to make sense to the audience. It became apparent that the depiction of something already so vague and complex



could be justified within still images, even if they are categorized into different aspects. It was a process that required a lot of more research and hundreds of paintings to be made, but then decided to change my direction and look into a different medium which could be more self-explanatory.

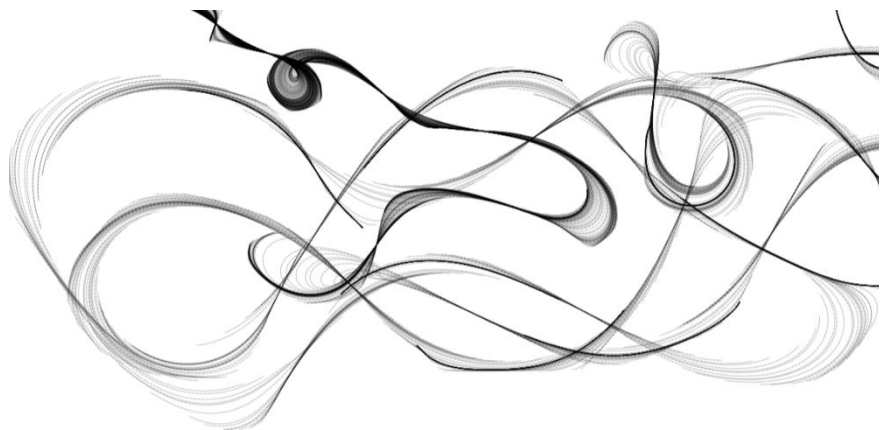
This is when I decided to change my direction and try to make a moving image, which could depict a fluidity between different shapes, colours, and forms. I looked into installations that could move, in order to capture the audience's interest, but I found myself getting more attracted to the idea of sculptures, and in particular, kinetic sculptures. Kinetic art is interesting as moving sculptures extend the meaning of time and interact with the space they're installed in, which appealed me, but it did not seem feasible enough at the time. I started researching into generative art, and found one of its branches, Experimental Animation. Through computing and coding, I could make a series of animations that do not necessarily have a narrative or the linearity that most animations do, as it is left up to the audience's own interpretations. As compared to the media created on Adobe After Effects, the visuals that I started to develop on Processing 3 gave the mysterious effect which was perhaps missing otherwise. I started to look into how Processing could also help me make my moving visuals interactive, which is when I started to feel that just the animations won't be enough for my project either, and I started to get more engaged by the interactive concept, which will be part of the final product of my project later.

## Chapter 4

### 4.1 PRODUCTION –

The following visuals will be brought forward one by one, most with a visual or conceptual representation attached to it, mostly referring to time itself, its research, and the overall visual narrative they form. Keeping in mind the medium chosen, the main feeling I tried to incorporate in my visuals for my audience to feel is relief from their everyday stress as they come into contact with my work.

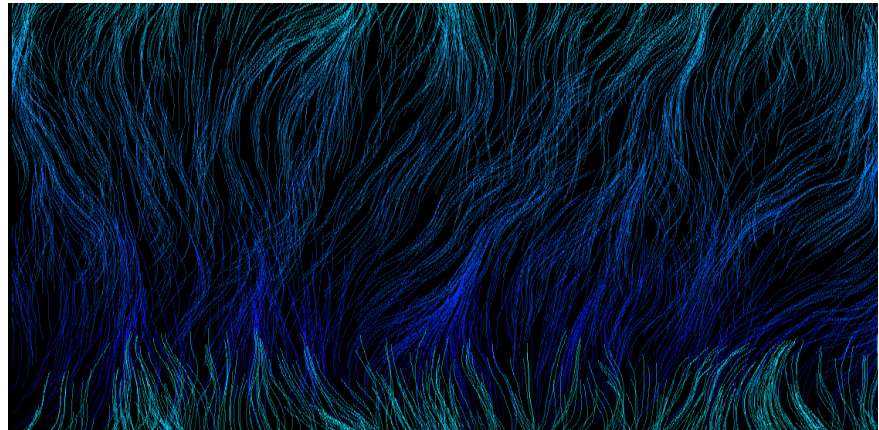
All the visuals have been named, without any other explanation given to the audience, for the title itself should be self-explanatory, thus making the audience themselves wrap their thoughts and minds around it. The particular narrative is important as it focuses on the constant fluidity of the word time itself, which one will notice as they start to interact with the given works.



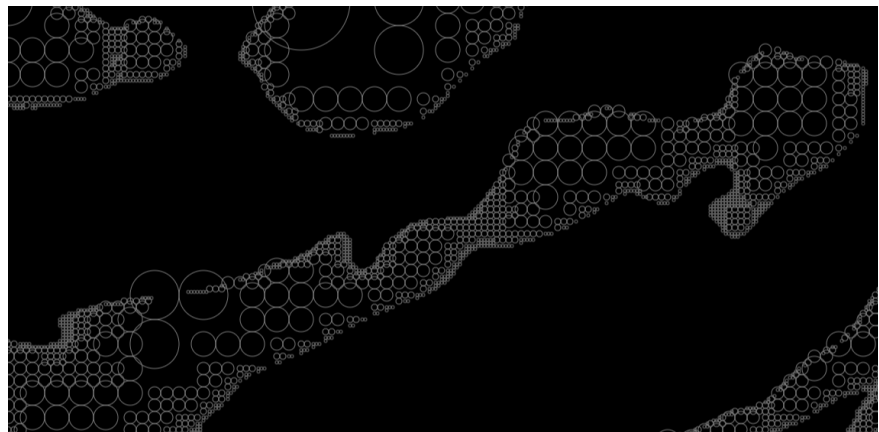
Sketch

*References*

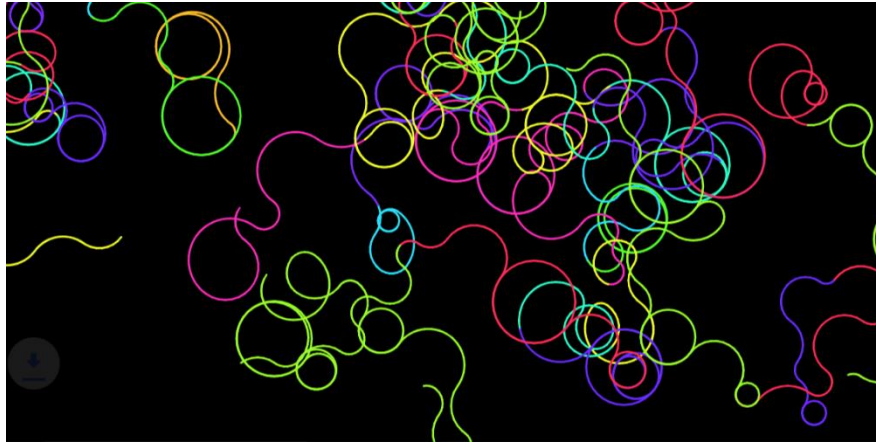
1: Markosian, N. (2014, January 24).  
*Time*. Retrieved from  
<https://plato.stanford.edu/entries/time/>



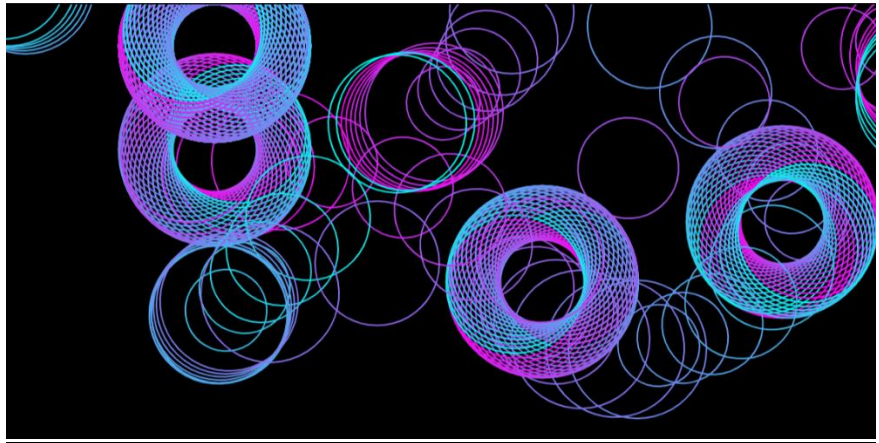
*Fabric of Reality*



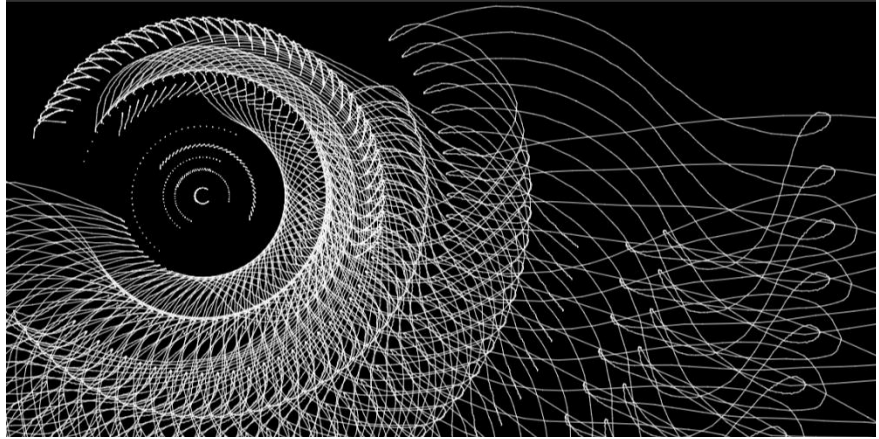
*Stream*



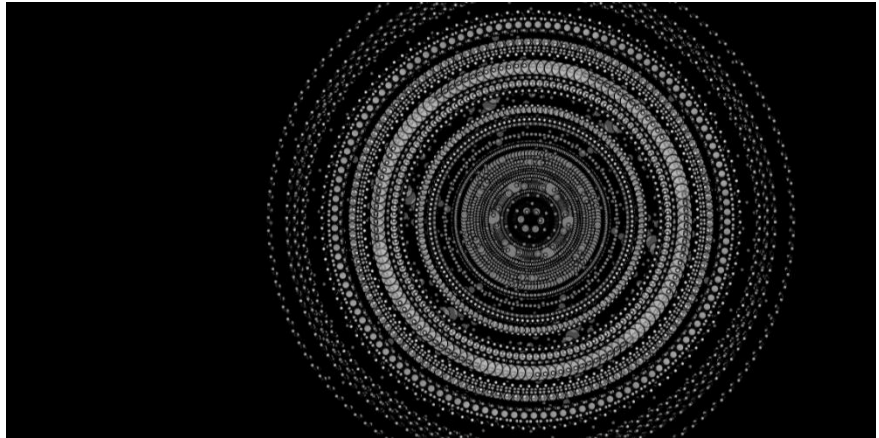
Noodles



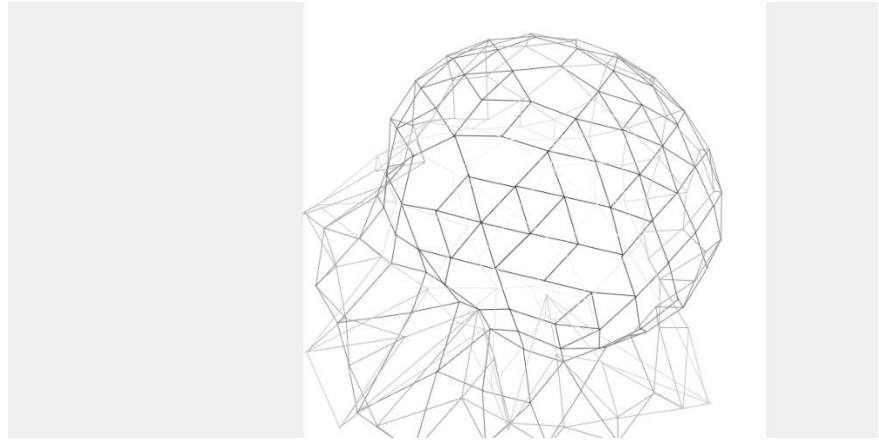
Slinky



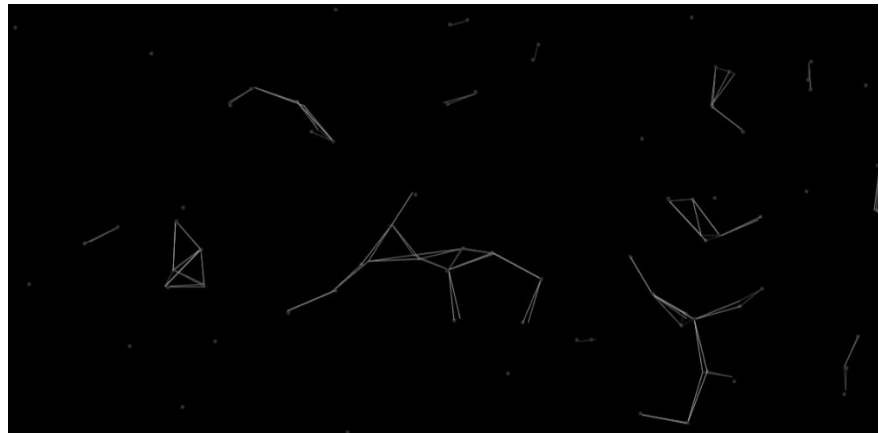
*Circulate*



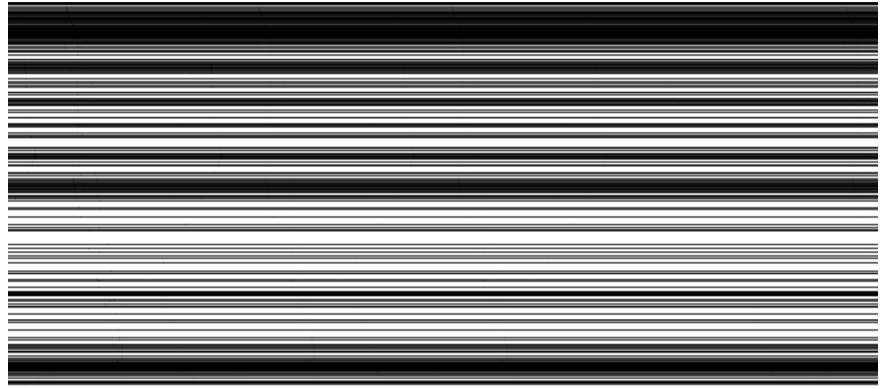
*Mandala*



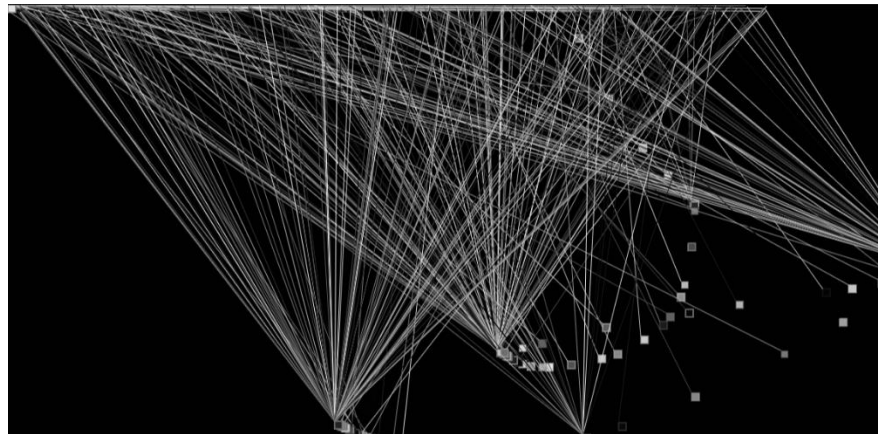
Unified



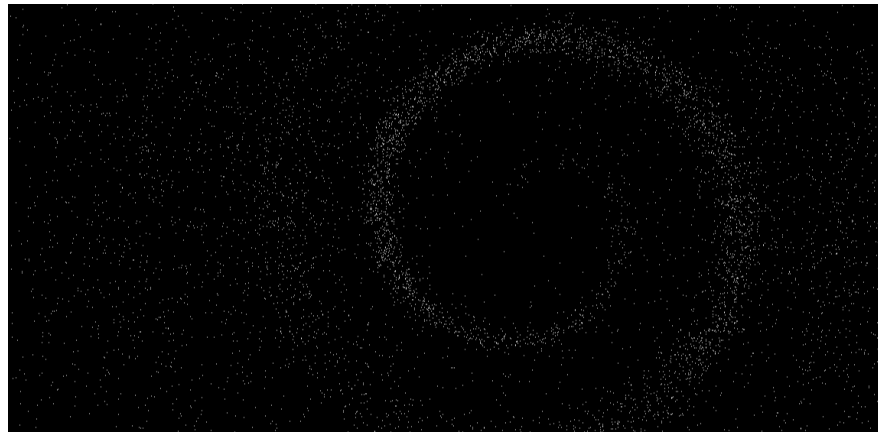
Separated



Barcode



Pendulum



*Spiral*



*Marbles*



## 4.2 CONCLUSION

By working on one project continuously for a year, I have come to learn a lot of things for it. One of the first things my thesis taught me is to thoroughly research the subject before indulging in the mechanisms or the visuals of it. My topic was such that it required a firm grasp at the base understanding in order for me to build something from it.

After looking back at the research I did to get where I am, I have realized that I have only but scratched the surface of a vast ocean. The information available over the internet alone can take years to absorb understand. this is such a topic, that it can be left as open-ended, or with a particular direction as a conclusion. one of the most important things i learnt is, that the final product, whichever medium it is, should be relatable enough for the audience, and that will automatically make the concept easier for them to understand.

I set out to acknowledge the importance of time, but there is so much more to it. It is a project which can be taken even further into bigger interactive installations, or it could even be tackled by changing the medium and the direction a bit. My visuals were not only to make people realize what the concept behind them was, but to make them feel at ease, and comfort as they interacted with my work.

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## **GLOSSARY** –

**Eternalism:** philosophical theory that suggests that time blends into space, merging the idea of past, present and future into one reality.

**Experimental Animation:** form of animation in which the visuals have their own rhythm and movement and may not have any narrative or a specific structure to follow.

**Kinetic Art:** any piece of art which has movement in order to have the desired effect of motion, as it interacting with space and time

**Mandala:** a Circular figure which represents the cosmos in the Hindu and Buddhist Symbolism

**Multiverse:** hypothetical space or realm consisting of a number of universes, and our universe is one of them. (phenomenon)

**Ouroboros:** a circular symbol depicting a snake, or less commonly a dragon, swallowing its tail, as an emblem of wholeness or infinity.

**Portal:** A doorway, entrance etc into a room, or dimension in our case

**Time Travel:** travel through time into the past or the future (phenomenon)

