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The Girl in the Museum

short film exploring the relationship between women and art

October 2020

The Girl At The Museum

Short Film Exploring the Relationship between Women and Art

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Abstract

Women have always been a subject of art but the art that they themselves create has been systematically excluded from art history records for centuries. This has left us with a one-sided point of view of the portrayal of women in art and of art itself. In order to tackle this discrepancy, this work intends to create an animation presenting and shining a spotlight on the work of several female artists. In order to create this film I will delve into the history of animation, more specifically animation which mixes both 2D and 3D animation techniques and analyze the films: "The Prince of Egypt", "Spirited Away", "Howl's Moving Castle" and "Paperman", by examining how they utilize these techniques in order to tell a compelling story. All with the intention to create an animation showcasing several artworks by artists in different fields. The artists chosen to study were Geng Xue, Helena Almeida, Barbara Kruger, Berthe Morisot, Guntal Stölzl, Yayoi Kusama, Marina Abramović and Qing Han. And from this lineup I ultimately chose to highlight the work of Geng Xue, Helena Almeida, Berthe Morisot, Guntal Stölzl, Yayoi Kusama, Marina Abramović and Qing Han.

Keywords

Resumo

As mulheres sempre foram objecto de estudo em arte, mas a arte que elas mesmas criam tem sido sistematicamente excluída dos registos da história da arte há séculos. Isto deixa-nos com um ponto de vista unilateral sobre a participação da mulher no mundo da arte e da própria arte em si. Para enfrentar esta discrepância, este trabalho pretende criar uma animação a apresentar e chamar a atenção ao trabalho de várias artistas femininas. De maneira a criar este filme vou antes explorar a história da animação, especificamente sobre a animação que mistura técnicas em 2D e 3D ao analisar os filmes: "O Príncipe do Egito", "Spirited Away", "Howl's Moving Castle" e " Paperman", examinando como estes utilizam estas técnicas para contar uma história convincente. Isto é feito com a intenção de criar uma animação que apresenta e destaca o trabalho de artistas em diversas áreas. As artistas que escolhi investigar são Geng Xue, Helena Almeida, Barbara Kruger, Berthe Morisot, Guntal Stölzl e Yayoi Kusama. Desta lista decidi destacar o trabalho de Geng Xue, Helena Almeida, Berthe Morisot, Guntal Stölzl, Yayoi Kusama, Marina Abramović e Qing Han.

Palavras-Chave

Video, Curta-Metragem, Animação 2D, Animação 3D, Feminismo, Arte

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Chapter 1

Introduction

"The mirror was often used as a symbol of the vanity of woman. The moralizing, however, was mostly hypocritical. You painted a naked woman because you enjoyed looking at her, you put a mirror in her hand and you called the painting "Vanity", thus morally condemning the woman whose nakedness you had depicted for your own pleasure." - John Berger, Ways of Seeing [1, page 51]

Throughout History, women have always been a subject of great interest to artists all over the world and are very often depicted in art. However the art that is created by women themselves is often disregarded and forgotten. This has created a narrow-minded perspective in Art itself of what it means to exist as a woman, being seen and represented only through the eyes of men.

This thesis intends to address how women have been, and continue to be, sidelined in the art world, by showcasing their work in an animated short film. It will contain at least two animations techniques: the 2D animation will be reserved for the main character and the 3D for the artist's works that will surround her. This will allow for the viewers to distinguish that the main character is in a "different world" than her own. The final product will focus on presenting noteworthy female artists by showcasing their work.

1.1 Motivation

Almost 50 years ago, Linda Nochlin wrote "Why Have There Been No Great Women Artists?", an article featured in the January 1971 issue of ARTnews. In it, she ventures into the reasons why it was "impossible for women to achieve artistic excellence, or success, on the same footing as men, no matter what the potency of their so-called talent, or genius". [2]

The conclusion she offers is that, historically, women have always been barred from attending "high art" education. But as times and circumstances change, we now know that to no longer be the case. In fact, in many countries, women now make up the majority of art and design graduates:

In the United States for example, women earn 70% of Bachelors of Fine Arts. See figure (1.1)
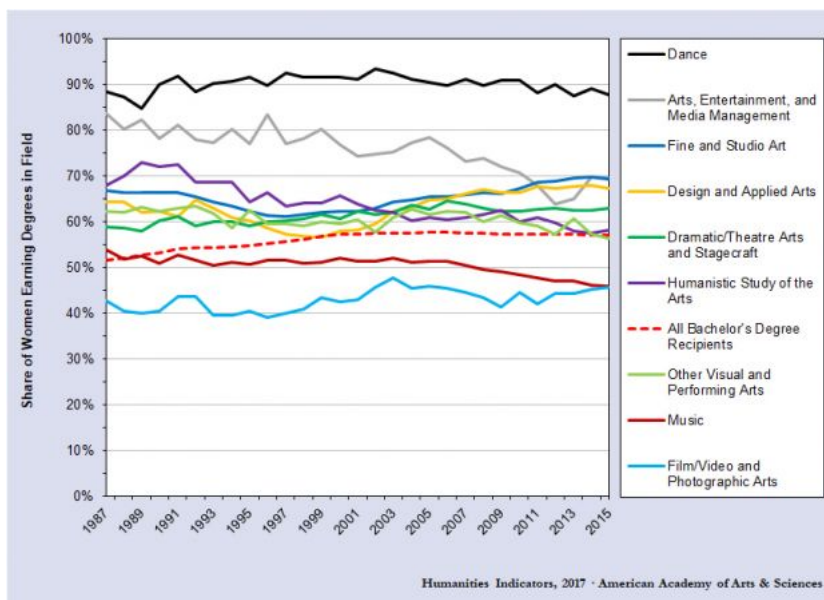
Figure 1.1: Percentage of Humanities Bachelor's Degrees Awarded in the USA to Women, Selected Disciplines, 1966–2015

[3]

In Australia, Women earn 75% of art degrees [4] and in the U.K., approximately 64% of undergraduates and postgraduates in creative arts and design are women. See figure (1.2)

	2012/13				2013/14				2014/15				2015/16				2016/17			
	Female	Male	Other	Total	Female	Male	Other	Total	Female	Male	Other	Total	Female	Male	Other	Total	Female	Male	Other	Total
(1) Medicine & dentistry	5,755	4,425	0	10,180	5,500	4,285	0	9,780	5,645	4,370	0	10,015	5,470	4,265	0	9,735	5,475	4,330	0	9,805
(2) Subjects allied to medicine	31,690	7,790	5	39,480	33,200	8,245	5	41,450	34,790	8,165	0	42,955	35,455	8,235	0	43,695	37,660	8,735	5	46,405
(3) Biological sciences	23,420	15,510	5	38,935	25,555	17,020	0	42,580	24,185	15,265	0	39,455	25,455	16,220	5	41,680	26,700	16,810	5	43,520
(4) Veterinary science	660	190	0	845	695	200	0	900	815	265	0	1,080	815	245	0	1,065	810	245	0	1,055
(5) Agriculture & related subjects	1,840	935	0	2,775	1,905	1,045	0	2,950	1,755	950	0	2,700	1,830	950	0	2,780	2,000	930	0	2,930
(6) Physical sciences	6,785	9,610	0	16,400	7,175	10,120	0	17,300	6,810	9,960	0	16,770	6,875	9,995	5	16,875	7,375	10,490	10	17,870
(7) Mathematical sciences	3,490	4,940	0	8,430	3,630	4,975	0	8,605	3,410	4,900	0	8,310	3,365	5,055	5	8,425	3,510	5,365	5	8,885
(8) Computer science	2,675	12,890	5	15,565	2,710	13,375	0	16,080	2,705	12,880	5	15,595	2,480	12,795	5	15,280	2,585	14,215	5	16,805
(9) Engineering & technology	3,830	20,920	5	24,755	3,875	21,990	5	25,870	3,835	21,565	5	25,400	3,905	21,200	5	25,110	4,140	22,140	5	26,280
(A) Architecture, building & planning	3,140	6,900	0	10,040	3,125	6,310	0	9,435	2,860	5,335	0	8,195	2,865	4,965	0	7,835	2,815	4,850	0	7,665
Total - Science subject areas	83,280	84,105	15	167,405	87,370	87,565	15	174,950	86,810	83,655	15	170,480	88,525	83,930	30	172,480	93,065	88,115	35	181,215
(B) Social studies	24,485	15,615	10	40,110	25,970	16,745	5	42,720	23,330	14,745	5	38,080	24,655	15,435	5	40,100	25,620	15,715	20	41,355
(C) Law	10,995	6,500	0	17,495	11,180	6,700	5	17,885	10,960	6,365	0	17,330	11,280	6,430	0	17,715	11,415	6,385	5	17,805
(D) Business & administrative studies	30,700	30,190	5	60,890	32,060	31,940	0	64,000	30,355	29,340	5	59,705	30,260	29,395	0	59,660	31,190	30,840	5	62,035
(E) Mass communications & documentation	6,455	5,155	0	11,615	7,085	5,265	0	12,350	6,175	4,410	0	10,585	6,310	4,420	0	10,735	6,435	4,580	0	11,015
(F) Languages	16,970	6,790	0	23,760	17,225	6,930	0	24,160	16,090	6,385	5	22,475	15,580	5,865	10	21,460	15,675	5,895	15	21,585
(G) Historical & philosophical studies	9,485	8,650	0	18,135	9,835	8,805	0	18,645	8,670	7,615	5	16,290	9,370	7,990	15	17,375	9,625	8,220	10	17,855
(H) Creative arts & design	26,070	15,405	10	41,485	27,705	15,935	5	43,645	24,500	13,940	15	38,450	25,040	14,000	10	39,055	26,265	14,115	20	40,395
(I) Education	15,910	2,460	0	18,370	16,305	2,560	0	18,865	15,800	2,380	0	18,180	15,435	2,185	5	17,620	15,035	2,200	0	17,230
(J) Combined	2,815	1,740	0	4,555	2,770	1,640	0	4,415	2,390	1,615	0	4,005	2,185	1,445	0	3,630	2,380	1,465	0	3,845
Total - Non-science subject areas	143,880	92,500	30	236,410	150,135	96,530	20	246,685	138,275	86,790	35	225,100	140,120	87,170	55	227,340	143,645	89,410	70	233,125
Total - All subject areas	227,160	176,610	45	403,815	237,505	184,095	30	421,635	225,080	170,445	50	395,580	228,645	171,100	80	399,820	236,710	177,525	105	414,340

Figure 1.2: Percentage of qualifications obtained by subject area and sex, 2012/13 to 2016/17 in the UK

[5] [6]

But despite the fact that the majority of art degrees are now given to women, the cycle of sexism that we have seen throughout history continues to repeat itself. The reality is, that despite these numbers, women are still sidelined not only when it comes to their art but also when it pertains to leadership:

"Across all AAMD member museums, women hold less than 50% of directorships, and the average female director's salary lags behind that of the average male director"[7]

This obvious disadvantage trickles down to the rest of the art world, including what artists then get to display their work and have exhibitions as we can see in figure (1.3), (1.4), (1.5), and (1.6).
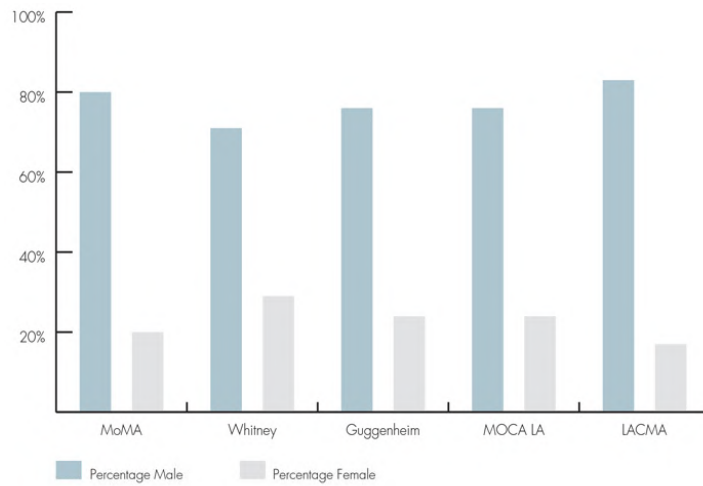
Figure 1.3: Percentage of Solo Exhibitions at American Institutions, 2007-2014
[8]
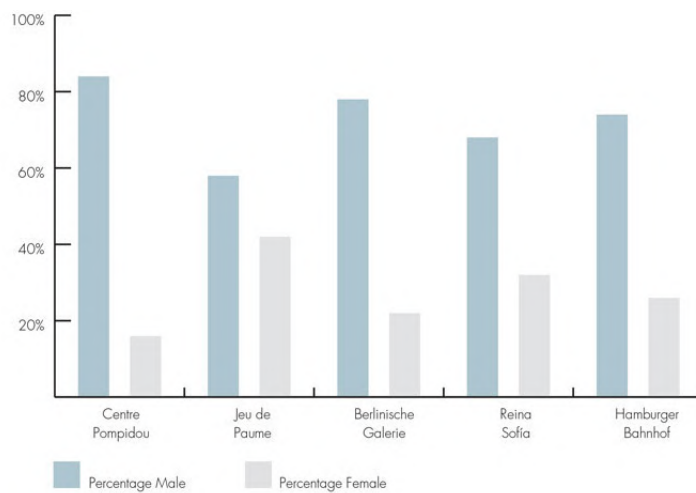
Figure 1.4: Percentage of Solo Exhibitions at French and German Institutions, 2007-2014
[8]

As we can deduce from viewing these graphs, women are always minorities in solo exhibitions held in America, Germany, France, and the UK but in some cases, such as in the Museum of Modern Art, women's solo exhibitions are practically non-existent.
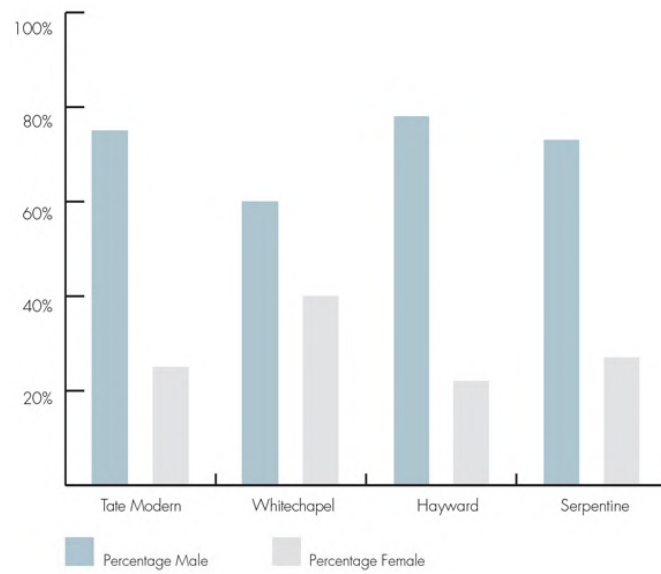
Figure 1.5: Percentage of Solo Exhibitions at United Kingdom Institutions, 2007-2014
[8]
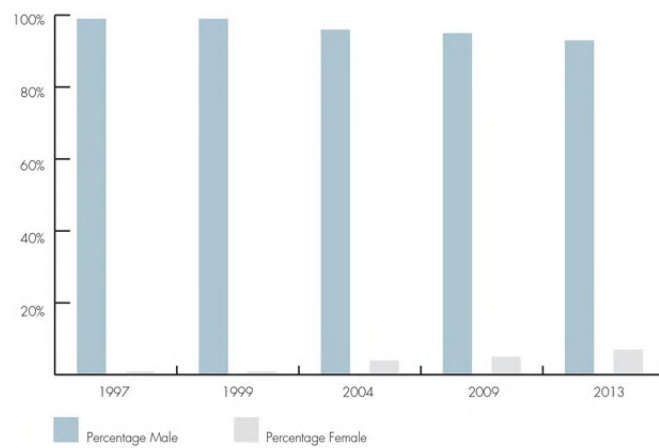
Figure 1.6: Museum of Modern Art in New York, Percentage of Permanent Exhibitions Displays
[8]

Not only is women's work a minority at almost all museums, but the discrepancy between the monetary value of their art is also significant. If we look at the price difference between the most expensive paintings ever auctioned off, we can see that the one made by a man was sold for ten times the price of the one made by a woman.

I'm referring to Leonardo da Vinci's "Salvator Mundi" sold for: $450.3 million at Christie's (November 15, 2017)[9] and Georgia O'Keeffe's "Jimson Weed/White Flower No. 1", sold for: $44.4 million (equivalent to US$47 million in 2018) at Sotheby's (November 20, 2014).[10]

However, this comparison is often dismissed, given that the artist Georgia is being compared to is Leonardo Da Vinci. But even if we were to narrow it down by only comparing Georgia's painting to other American artists of the same art movement as hers, (Modernism) the discrepancy is still considerable.

For example, Jackson Pollock's "Number 17A" (1949) was sold in 2015 for over US$200 million dollars [11], and Mark Rothko's No 6 (Violet, Green and Red)(1951) was sold in 2014 for US$200 million dollars [11], both of these almost four times the price of O'Keefe's.

And even when we examine the 100 most expensive paintings sold at auctions, we can clearly see that there are no female artists on the list [11] and Georgia O'Keeffe is nowhere near even entering it, let alone any other female painter.

Despite this, museums are filled with artworks depicting women, while artwork created by women goes ignored. This perpetuates the antiquated idea that women themselves are to be seen, but not their work.

As John Berger put it, "Men act and women appear. Men look at women. Women watch themselves being looked at. This determines not only most relations between men and women but also the relation of women to themselves. The surveyor of woman in herself is male: the surveyed female. Thus she turns herself into an object - and most particularly an object of vision: a sight." [1, page 47]

The group Guerrilla Girls, who wear gorilla masks to draw attention away from their identities and their gender, have often spoken out about these discrepancies and instead of asking "Why haven't there been more great women artists in Western history?" instead ask "Why haven't more women been considered great artists throughout Western history? [6]

Figure 1.7: *Do Women Have To Be Naked To Get Into the Met. Museum?* (1989) by Guerrilla Girls

[12]

The reality is that female artists have been systematically excluded from art history records for centuries. Not only that but several artforms traditionally done by women such as textiles are still to this day dismissed as "arts and crafts". [13] By acknowledging the discrepancy in the way female artists are treated and how their work is undervalued, we can then begin to even out the playing field by popularizing female artists from different fields to the general public. This, in turn, will hopefully educate and inspire people to become more knowledgeable and research artwork made by women.

1.2 Framing

The final result will depict the work of 6 female artists, all of which worked in different mediums, and will be approximately 5 to 10 minutes long. It will utilize 2D computer animations alongside 3D assets.

The animation will follow a young girl who visits a museum. Irritated by the lack of female artists but an abundance of women in the paintings and sculptures, she kicks one and part of it falls on her, rendering her unconscious. When she awakes, she finds herself in a new world which she then explores.

The 2D animation will make use of modern tools so as to avoid the traditional hand-drawn frame by frame style of animation which is incredibly time-consuming. Instead, it will make use of computer animation utilizing After Effects, which will still give it a hand-drawn appeal without the additional work. As for the 3D elements, these will help the audience make the distinction between the main character and the art represented around her. By having the distinction of being 3D it will give it a other-worldly aura and will allow for several angles to be shot without the usual constraints of 2D animation.

1.3 Overall Objectives

The overall objective is to explore how the 2D and 3D can be combined in order to create a cohesive and aesthetically pleasing result while simultaneously bringing female artists' work to life. Which will in turn, hopefully, incentivize people to research more female artists and their contributions to art. In order to reach a wider audience for this to happen, I will attempt to find different platforms in which to share the final result, such as competitions, film festivals and sharing it online.

Chapter 2

State of the Art

2.1 Introduction

In this section, we will be going over the history of computer generated graphics in cinema, specifically pertaining to the mixing of 3D elements and 2D animation. Then we will examine specific examples and the techniques utilized and finally the technology I will be using in the final result of the project.

2.2 History

Computer-generated graphics in cinema and television don't have a particularly long history. The first usage of 2D computer-generated images was in Michael Chrichton's sci-fi western film, "Westworld" in 1973, where the point of view of the main character, who was a robot, was pixelated in order to convey to the audience that he was not human. This was a very expensive and time-consuming process, as each frame had to be color-separated, scanned and then converted into squares.[14]

Its sequel, "Futureworld", was released in 1976 and it featured the first use of 3D CGI in a live-action film, in a brief scene of a computer-digitized 3D rendering of a hand and face.[15]

While these scenes might not seem very impressive today, they marked the beginning of an era. From there, the use of CGI has only expanded and the mixture of techniques has come to produce incredible results. Specifically regarding the mixing of 2D animation and 3D animation techniques.

One of the earliest examples of this can be found in the Disney film "Beauty and the Beast", released in 1991. In the ballroom scene, where Belle and the Beast dance together, we can see that the ballroom itself is 3D. Every frame of the scene was created with Disney's Computer Animation Production System which was co-developed with Pixar. It was the first time traditionally 2D animated characters were placed in a 3D background. [16]

Figure 2.1: Beauty and the Beast: Ballroom scene
[17]

The opposite happened when 3D animals were placed in a traditionally painted background in the "Lion King", also released by Disney in 1994. This takes place during the stampede scene, which took nearly 3 years and the creation of a new computer program to complete. A number of animals were created in a 3D computer program and then duplicated several times to make it seem as if a huge number of animals were stampeding down the painted background.[18]
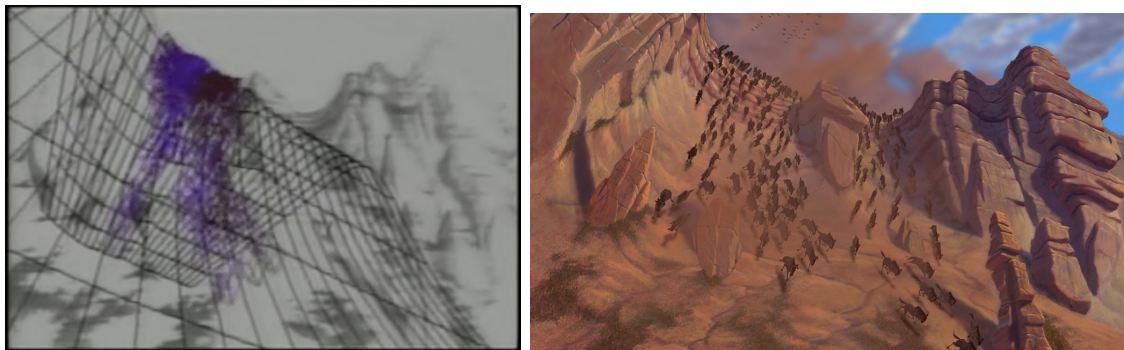
Figure 2.2: Lion King: Stampede scene
[19]

In Japan, Katsuhiro Otomo produced an animated science fiction anthology film called "Memories" which was released in 1995. It merged CG animation with 2D artwork seamlessly in scenes such as at the beginning of "Cannon Fodder" where a child runs along a corridor. For this scene, a 3D model of a corridor was made and then composited with 2D animation.[20]

Two years later, Studio Ghibli released its film "Princess Mononoke", which was the studio's first foray into utilizing 3D CG. Wanting CG to emulate the look of cel-shading, Hayao Miyazaki approached Microsoft in order to create a software that did just that. This event marked the creation of Toon Shader, used in every major Studio Ghibli film since. [21]

"The Prince of Egypt", a 2D animated film released in 1998 by DreamWorks featuring several scenes with 3D elements. At the time, it was the most expensive classically animated film, with a budget of $60 million. But unlike "Princess Mononoke" its blend of CG and traditional animation wasn't as smooth and unnoticeable. Regardless, it featured many impressive scenes such as the 7-minute parting of the Red Sea which took 318,000 hours to render. [22]
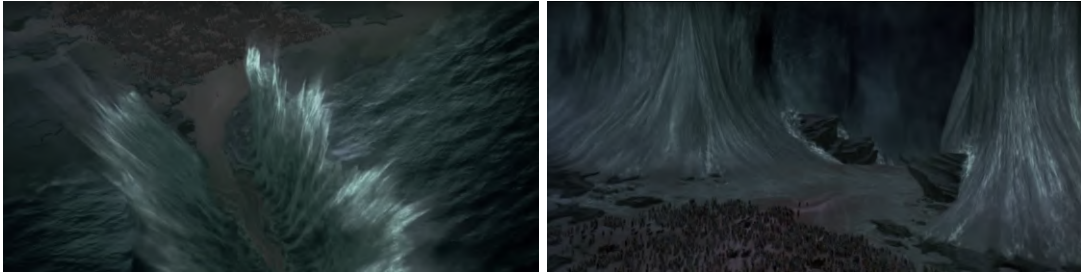
Figure 2.3: The Prince of Egypt: Parting of the sea
[23]

"Tarzan", released by Disney, took the most expensive animated film spot from The Prince of Egypt in 1999 with a budget of $130 million. It utilized the computer software Deep Canvas which allowed for the creation of 3D backgrounds which would then be painted over in order to imitate the look and style of the rest of the film. [24]

Figure 2.4: Tarzan: Tree climbing scene
[25]

For the next few years, there was a noticeable focus on 3D animation in the entertainment industry with several major studios releasing only 3D animated films. The only notable exception to this was Studio Ghibli which released several 2D films such as "Spirited Away" in 2001 and "Howl's Moving Castle" in 2005, both of which were traditionally animated films featuring small and barely noticeable 3D elements throughout both films. [26] [21]

"Paperman", however, had a different approach. Released in 2012, this short film mixed 2D and 3D technology intrinsically in the animation process. Using the software Meander, it makes use of 3D animation and assets while allowing artists to draw over said animations to give it a more traditional animated look and style. [27]

There are also interesting cases of 3D animations that bear some resemblance to 2D while utilizing small 2D background elements. Such is the case in the film "Deathly Hallows Part 1" of the Harry Potter Franchise released in 2010. It features a 3D animation sequence directed by Ben Hibon inspired by the work of Lotte Reiniger, an Austrian animator who made silhouette style animations. [28]

Figure 2.5: Harry Potter and the Deathly Hallows: Part 1
[29]

The same idea but reversed can be observed in "Klaus", a 2019 2D animation Netflix film made to bear a strong resemblance to 3D animation styles while only actually utilizing very few 3D elements created in order to save animators some time such as some scenes with the reindeers. [30]

Figure 2.6: Klaus: The trailer
[23]

As we can see, utilizing both 2D and 3D animation techniques simultaneously isn't uncommon, it is however, usually done with the intention of supplementing the original medium, like with "Beauty and the Beast", "Lion King" and "Tarzan", where 3D techniques are only employed in very specific scenes and used in order to create a scene that would have otherwise been too difficult to do in 2D animation.

The exception to this rule is "The Prince of Egypt". While most 3D scenes are still used as a supplement to the traditionally drawn animation, they are also sometimes exclusively used as a storytelling tool. Such is the case in the musical scene "All I Ever Wanted", where hieroglyphs on a 3D wall tell the story of how all male Hebrew babies were sentenced to death, showing Moses what could have been his fate.

Another notable exception is Paperman, where instead of supplementing 2D animation with 3D techniques, the opposite happened. The 3D assets and animations were created and then supplemented with hand-drawn animations in order to create a unique style.

However, none of these films truly utilize 3D elements and techniques in order to convey a feeling of other-worldliness, with the exception of the short animation in the "Deathly Hallows Part 1" of the "Harry Potter" franchise called the "Three Brothers". In the animation, after getting into a fight, one of the brothers is killed in his sleep. His death is punctuated by a sharp change of style, the candle on screen going from being 3D to 2D with a paper texture, the background turning black and the blood splatters appearing on screen.

It is this jarring and attention-grabbing contrast of techniques that I intend to utilize in the short film, with the objective of portraying to the audience that the world in which our character is in transcends her own.

2.3 Case Studies

2.3.1 Introduction

In this section we will analyze movies with cinematography, animation and story-telling techniques that are relevant to the short film that will be created, which is the ultimate goal of this thesis. These four films were selected based on their diverse and effective techniques that were used to create and tell a compelling story while still managing to do it in an aesthetically pleasing way.

2.3.2 The Prince of Egypt (1998)

"The Prince of Egypt" is an animated musical re-telling of the Book of Exodus and in it, we follow the story of Moses. It was a very ambitious film for its time, released by Dreamworks in 1998 with a budget of $60 million and it featured 1,192 special effects, one of the most notable ones being the chariot race scene. This scene utilized a new piece of software called "Exposure Tool". This software allowed for the artists to merge the 2D and 3D elements such as when the camera weaves around the scenery. [31]

Figure 2.7: The Prince of Egypt: The chariot scene
[29]

Another example, as previously mentioned, is the "All I Ever Wanted" scene which was used to tell Moses the story of what could have happened to him as a child. He is shown the gruesome reenactment of the death of many children in the form of hieroglyphs moving on the 3D walls. The attention to detail, allows one to see the indents of the wall where the hieroglyphs are as the camera pans around rapidly. This method of "show don't tell" is an effective story-telling tool that utilizes 3D assets, but still maintains a stylistic connection to the rest of the traditionally animated film.

Figure 2.8: The Prince of Egypt: All I Ever Wanted Scene
[32]

2.3.3 Spirited Away (2001)

Even Miyamoto Miyazaki, the man behind Studio Ghibli, who is famously known to be reluctant to use too much CG in his animated films, has used it on several films. It is, however, used sparingly and carefully so that it blends into the scene in such a way that it is not noticeable to the untrained eye. One of these such instances is in "Spirited Way", a 2D film with features some interesting 3D elements created to elevate certain scenes. "Spirited Away" is a 2001 film created by Studio Ghibli which features a young girl named Chihiro who goes on an adventure after she inadvertently enters a magical place and her parents get themselves into trouble. There, she encounters many magical creatures and spirits and she must fight and grow in order to get her parents back. [26, pages 184-185]

One of these instances is when she is working in a bathhouse and is tasked with cleaning a dirty river spirit. In this scene, the spirit rises from the bath and exits in an explosion of water.

The creation of the scene started off with the drawing of the background which portrays a tub by the art team. Then using the software "Softimage", the studio layered the 3D objects in the background, followed by the preparation of the reflection elements which were hand-drawn and animated. And finally, the black and white gradation elements which depict the thickness of the foam were added.
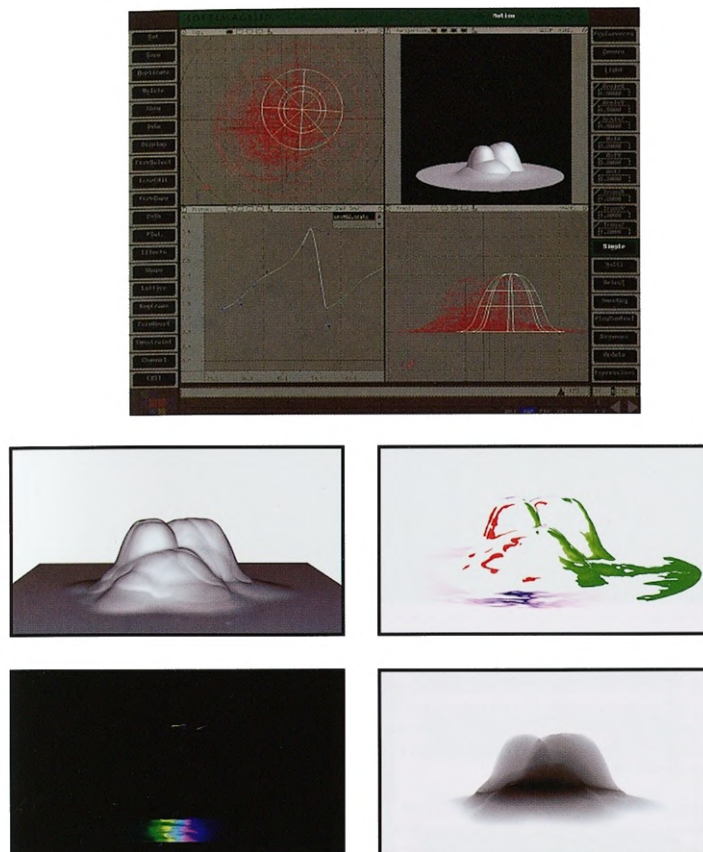
Figure 2.9: Spirited Away: Creating the water of river spirit
[26]

15
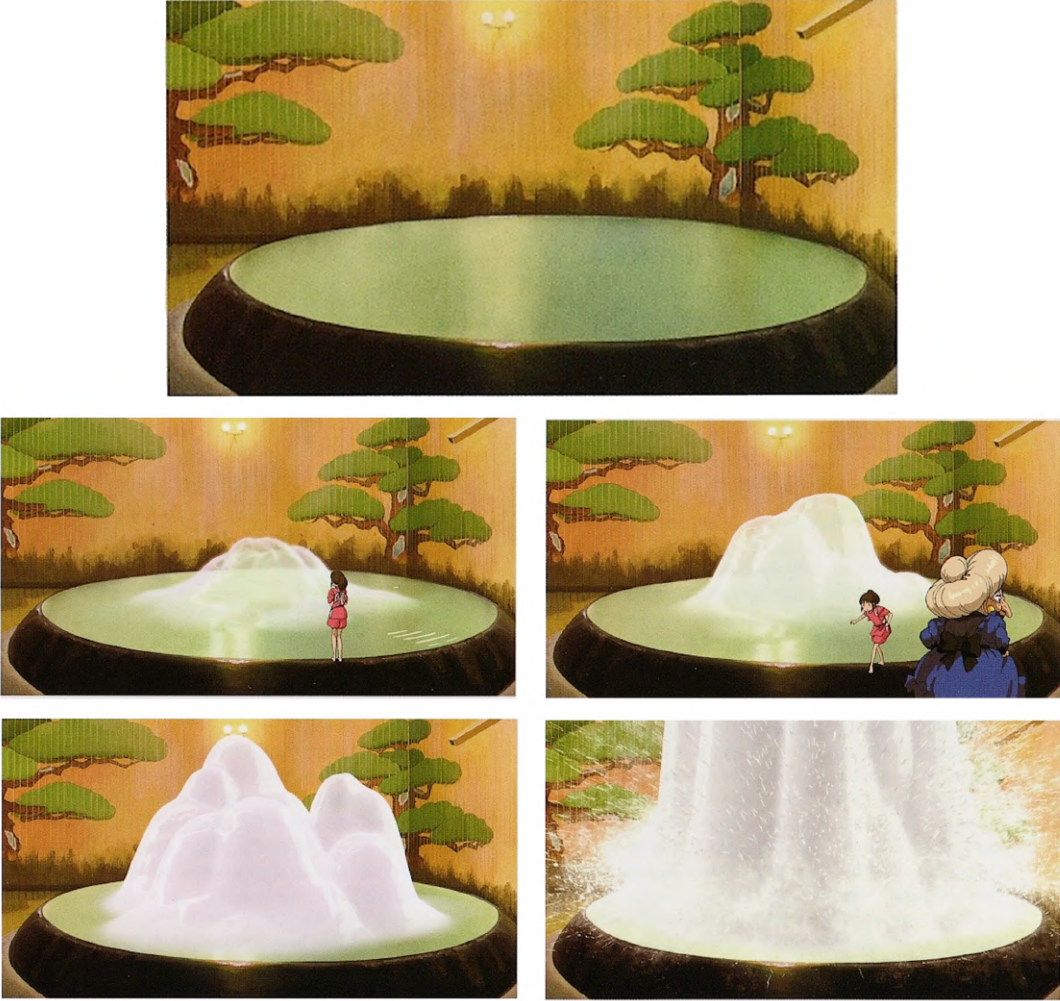
Figure 2.10: Spirited Away: The river spirit leaving the bathhouse scene
[26]

Another scene which utilizes 3D elements, happens when Chihiro's parents' gluttony gets them into trouble. They eat from the feast that was prepared, but because this food was not meant for them, it curses them into the forms of pigs. In the scene where they eat there is a plate which is actually a 3D object which was carefully painted with as much detail as the background drawing. This was then mapped into the 3D object in order to not draw attention when to it before it moved.

Figure 2.11: Spirited Away: Plate scene
[26]

2.3.4 Howl's Moving Castle (2004)

Also created by Studio Ghibli is "Howl's Moving Castle", a film adapted from the book by Diana Wynne Jones of the same name. It follows the story of a young girl named Sophie who gets a curse placed upon her which transforms her into an elderly lady in her 90's. She then meets a wizard named Howl and her adventure begins. [21]

Much like in "Spirited Away", it utilized 3D elements sparingly and only when necessary, however it contained double the number of CG shots. One of these instances is in the wormhole scene in which Sophie falls into. The hole was drawn with vertical and horizontal paths and morphed over a time interval. [21]
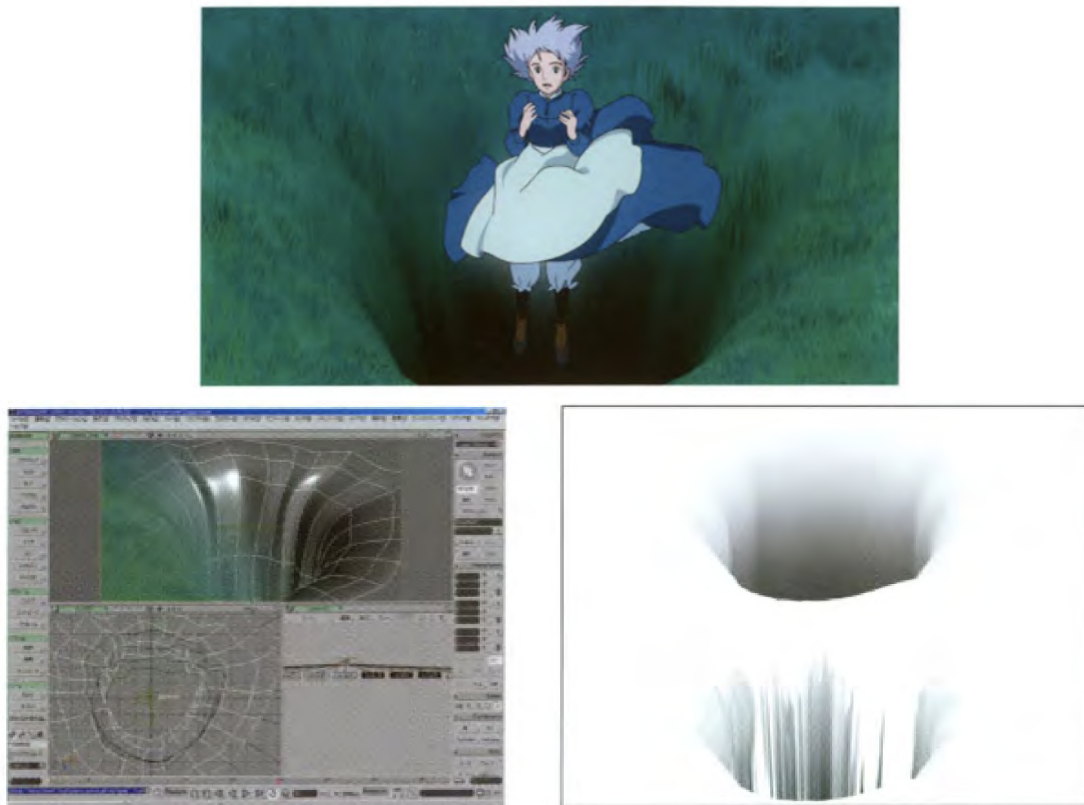
Figure 2.12: Howl's Moving Castle: The wormhole
[21]

But by far the most interesting CG element of the film is the castle itself. The art of the castle was broken down into many parts and each part was animated within their respective planes in order to make it appear three dimensional. They began by creating the movements for the main body and have the other pieces swing out of sync. And while the castle itself was composed of drawings, the legs of the castle which propelled it were 3D CG.

Figure 2.13: Howl's Moving Castle: Howl's Castle
[21]

2.3.5   Paperman (2012)

The animated short named "Paperman" was released alongside the theatrical release of Wreck-It Ralph in 2012. It was directed by John Kahrs and won the Academy Award for Best Animated Short Film at the 85th Academy Awards. It's set in the 1940's and it is colored accordingly, with its black and white aesthetic, while taking place in New York City where a man and a woman have a peculiar first encounter. It was a film with a very unique style due to its innovative animation process. [27]

The team started off by modeling, rigging and animating the 3D models.[27] Next, came the creation of motion fields. The result being that each pixel from the CG animation that was rendered now has a 2D offset. Its' purpose is to track the movements of the CG model in each frame.[27] Silhouette ribbons were made in order to retain the visuals that traditional animation commonly conveys. The characters were then divided into "topologically-cylindrical components by offsetting the silhouettes perpendicular to the camera direction." And a paper texture was applied according to the motion fields.[27] Then, with the usages of the Meander Animation Tool, they were able to draw atop the 3D animations, creating its' signature style.[27] They also used motion pasting, which consists of "a group of strokes in one frame [...] selected by the artist and then 'pasted' into another frame, such that through all intermediate frames, the strokes are advected by the motion fields defined by the CG animation.", meaning all the frames in between them are drawn automatically.[27] And finally they used motion betweening, where the artist draws an initial keyframe and then draws on the next keyframe. The computer then calculates the correspondences and creates the inbetween frames.[27]
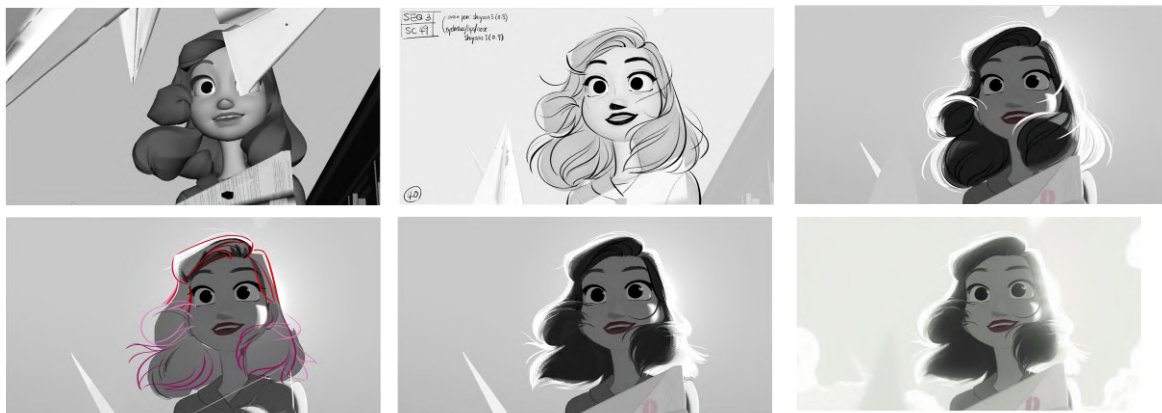
Figure 2.14: Paperman: The process
[33]

2.3.6   Conclusion

Unfortunately many of these techniques used in the films we have analyzed are heavily dependant on the software they were created with, and for the most part this software is not available to the public, as it was developed in-house with the sole purpose of being used by that studio. However, we can still learn a lot from the animation and storytelling techniques used in several scenes and utilize this knowledge with other software alternatives.

For example, in some of the 3D scenes in "The Prince of Egypt", the physical surroundings themselves relay the story to the viewer, rather than any expositional dialogue.

The creation and animation of the castle in "Howl's Moving Castle" is also noteworthy, where instead of the studio's usual hand-drawn animation, the drawing of the castle was broken down into pieces and their movement animated in order to simplify and speed up the animation process.

Another incredible animation detail is the lighting in "Paperman". Despite being a black and white film, it still manages to infuse life into every scene with its harsh and yet glowing ambience, giving the short film a dream-like feel.

As for story-telling, the main character in "Spirited Away" was a great inspiration. A small girl facing against a set of rules older than she can imagine in a world she doesn't know much about but wishes to discover and enter is an apt metaphor for the story I am trying to tell in this short film.

Chapter 3

Development of the Subject Matter and Script

3.1 Introduction

This section is dedicated to delving into the chosen artists and how they affected the subject matter and video that will be produced. There were different factors taken into account when choosing the artists to represent in the mini film.

Firstly, in order to narrow down the possible candidates, I chose to only look at artists of the last three centuries. Secondly, to showcase the variety of art created by women, I chose artists who worked in different mediums from one another. Thirdly, I specifically chose a few artists who worked in mediums that have often been disregarded in artistic communities and categorized as "not real art". Finally, their work had to be able to be reproduced and animated within a reasonable time frame.

However, despite all these factors there were still a wide variety of artists to choose from. The final choice ultimately came down to the relevance of their work to the topic at hand and if their work "fit" into the required scene.

3.2 Narrative

The main objective of the thesis is the creation of the short film in such a way that it showcases the selected works of these artists. But to do so, we must create a narrative that the audience can follow along with and make it so these different scenes showcasing the art are connected so the final result does not feel disjointed.

We begin then, with the main character who works as a vessel for the audience. She visits a museum where she sees a piece of art representing a woman but made by a man. She becomes frustrated and lashes out, kicking the sculpture in front of her. The aforementioned piece of art is a sculpture of a naked women holding a mirror - meant to reference John Berger's quote. [1]. The mirror falls off the sculpture and hits the main character's head, making her lose consciousness. When she awakes she finds herself within the artwork of the chosen artists. She travels through these worlds, until she finally returns to the museum with a new appreciation for art that isn't in the museum.

3.3 Original Chosen Artists

In this section I will present the original lineup of artists whose work I had chosen to represent in my film.

3.3.1 Geng Xue

Figure 3.1: Geng Xue (1983 -)
[34]

Gen Xue was born in Baishan, a city in China's Jilin Province, in 1983. Xue graduated from the Central Academy of Fine Arts in Beijing, China in 2007 with a Bachelor of Fine Arts and in 2014 she received a Master's of Fine Arts from the Central Academy of Fine Arts in Beijing. [35] [36]

Her work draws inspiration from traditional Chinese culture which she portrays in her ceramic works. Her use of porcelain is especially significant given it's historical relevance to her culture and heritage. Porcelain was invented in China and its usage can be dated back thousands of years. Even today, it can be found everywhere in the daily life of China's people. But despite the fact that it is a common household item, every piece holds a story embedded with cultural context with deep significance. It is due to this historical symbolism that Xue mostly works with porcelain and, by doing so, breathes new life into an ancient tradition with her own personal style. [34] Xue has had numerous exhibitions all over the world and was shortlisted for the Young Artist of the Year in the 11th Award of Art China (AAC) in 2017. Nowadays, she creates art and teaches sculpture at the Central Academy of Fine Arts in Beijing, China. [35]

The piece by Gen Xue that I chose to portray in the short film, is Mr. Sea, created in 2014. It was chosen first and foremost due to the eerie and unearthly feeling of the sculpture, perfect as a starting point for our main character as it representing the almost unwelcoming feeling many women have felt when trying to join the art world.

Figure 3.2: *Mr Sea* (2014)
[36]

3.3.2 Helena Almeida

Figure 3.3: Helena Almeida (1934 - 2018)
[37]

Maria Helena de Castro Neves de Almeida was born in 1934 in Lisbon, Portugal. She studied painting in the Faculty of Fine Arts at the University of Lisbon and graduated in 1955 and went on to become the most recognizable face of contemporary art in Portugal. [38] [39] [40]

Since the beginning of her career, she has always sought ways to question and reinvent traditional media such as painting. In her art, she presents a variety of works with different mediums such as painting, photography, and video. In these works, she challenges the concept of the space her body occupies and the art it produces. But the artist faced the conundrum of representing herself and her painting within the same piece. She overcame this in her exhibition "Inhabited Canvas" by utilizing black and white photography to capture her in the act of painting and then painting the photograph itself bringing in color to the piece. [38] [39] Helena passed away in 2018 at the age of 84 in her home in Lisbon and is regarded as one of the most original Portuguese artists of the twentieth century. [40]

The piece by Helena Almeida I chose to portray in the short film, is a self-portrait of her Inhabited Canvas series. The reason behind this choice is due to the fact that in it, she is seen tearing away the painting as if to make herself, the artist behind the art, be seen. This action of uncovering oneself and in a sense "parting the curtains" and entering a new world by doing so, serves as a metaphor for our main character as well.

Figure 3.4: *Inhabited Canvas* (1976)
[38]

3.3.3 Barbara Kruger

Figure 3.5: Barbara Kruger (1945 -)
[41]

Barbara Kruger was born in New Jersey, United States of America in 1945. She studied art at the School of Visual Arts at the University of Syracuse in 1965 and then design at Parson's School of Design in 1966, both schools located in New York City. [42] For the next decade, she spent her time working as a graphic designer and artistic director for several publications. As she worked, she also began to receive attention for her personal work. Her art typically involves photography and screenprinting. She utilizes images found in existing sources and then layers short, concise and aggressive text on top. Through this method, she critiques consumer culture, the media and even sexism with poignant pieces.[42] [43]

The piece by Barbara Kruger I chose to portray in the short film is "Untitled (Your gaze hits the side of my face)" created in 1981. Kruger has many works which pertain to feminist ideals such as "Untitled (Your body is a battleground)" and "Untitled (We Have Received Orders Not to Move)". However I chose "Untitled (Your gaze hits the side of my face)" for it pertains to the main issue the film intends to address: how most art depicting women is made by men with the objective of being seen by other men. This, along with the fact that in the collage we can see the sculpture of a woman, a callback to the sculpture seen in the beginning of the video.
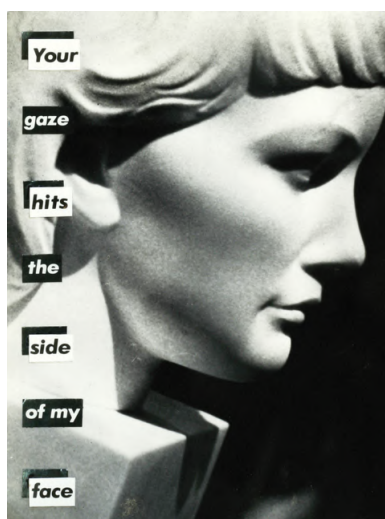

Figure 3.6: *Untitled (Your gaze hits the side of my face)* (1981)
[41]

3.3.4 Berthe Morisot

Figure 3.7: Berthe Morisot (1841 - 1895)
[44]

Berthe Morisot was born in 1841, in Bourges, France. Daughter to bourgeois parents, she received an art education from a young age, even visiting the Louvre several times in order to recreate paintings found there. At the time, being a professional female artist was practically unheard of and even her art instructor warned her parents to beware of allowing their daughter to pursue such an interest. Her parents, however, were lenient and allowed her to do as she pleased. In 1864, when she was only 23 years old, two of her landscape paintings were accepted by the official Parisian Salon, marking the beginning of her career. Unlike many of her peers, she continued to paint after marriage, her children's birth, and the death of her husband. She painted a variety of subjects such as landscapes, still-life and portraits. [44] While Berthe did not find commercial success in her lifetime, she did outsell several of her male peers such as Monet, Renoir and Sisley. She held her first exhibition in 1892 but she passed away only three years later in 1895 at the age of 45, after contracting pneumonia.[44]

The piece by Berthe Morisot I chose to portray in the short film is "Woman at Her Toilette" made in 1875-80. The reason behind this choice pertains to the previous artwork chosen, which showcases how the male gaze has affected art. After that, our main character is put on the spot of the "Woman at Her Toilette" and she looks at herself to realize that is is her gaze and her portrayal of herself that truly matters.

Figure 3.8: *"Woman at Her Toilette"* (1875-80)
[45]

3.3.5   Gunta Stölzl

Figure 3.9: Gunta Stölzl (1897 - 1983)
[46]

Gunta Stölzl was born as Adelgunde Stölzl in 1897 in Munich, Germany. She studied glass painting, ceramics, and art history at the Kunstgewerbeschule (School of Arts and Crafts) in Munich from 1913 to 1916 and in 1917 served as a nurse for the Red Cross in World War I voluntarily until the end of the war. [47] [48] In 1919, Gunta, as she was then known as, began studying at the Bauhaus in Weimar. She was excited by the prospect of a space were all artists were treated equally, but soon found that the founder of the Bauhaus had not been entirely honest about the supposed "equalitarian values" he advertised for the school.[48] Upon the realization that most of the enrolled students were women, he sent all the female students to the weaving workshop as he worried that this many female students would "weaken" the school's reputation. This sexist mindset remained until the end of Bauhaus. Women were barred from choosing their preferred artistic disciplines, never given high position jobs and barely offered any teaching positions. Gunta was one of the exceptions. [49] [47] In 1920 she was chosen to head the weaving class, in 1925 she became a craft master of the Weaving Workshop. In 1927 she was appointed as "Jungmeister" (Young Master) and was made responsible for the Weaving Workshop, which received so many orders it became the most profitable workshop of the Bauhaus.[47] Unfortunately, political tensions forced her to leave the Bauhaus in 1931. However, she then found success in several personal businesses and exhibitions even receiving the "Grand Prix" at the "Exposition Internationale de l'Urbanism et de l'Habitation" in Paris in 1947.[47] Gunta passed away in 1983 at the age 86 of in Zurich. [47]

The piece by Gunta Stölzl I chose to portray in the short film is "Slit Tapestry Red/Green" (1927-28). The reason for this choice is more abstract than the previous ones, but as Gunta herself had to face many adversities, in her life as an artist and a woman, so do any women who brave to enter and be part of the art world, including our main character. After being essentially mandated to do "women's work", Gunta took the discrimination she faced and made a legacy out of it. Ultimately the twists and turns (much like the ones we can see in her tapestry) of her life led her to create great art.

Figure 3.10: *Slit Tapestry Red/Green* (1927-28)
[50]

3.3.6 Yaoi Kusama

Figure 3.11: Yayoi Kusama (1929 -)
[51]

Yayoi Kusama was born in 1929 in Matsumoto, Japan. Ever since she was a young child, she's experienced hallucinations involving dots. These dots would become the focus of much of her work throughout her career. Despite not having any real formal art education, having only briefly studied art at the Kyōto City Specialist School of Arts, Kusama moved to New York City in 1957 where she became immersed in the Pop art scene and moved in avant-garde circles, even having her work exhibited alongside many well-known artists. [52] [53] Unfortunately, she found her ideas often being stolen by her male peers. [54] The pain of witnessing them rise to fame with her ideas was so unbearable that in 1965, Kusama threw herself out of her apartment window. However, her suicide attempt was unsuccessful and she managed to recover by continuing to create art that criticized art institutions. Because much of her art revolved around nudity she became the victim of much censure and criticism in Japan and when she returned in 1973 she found herself alone and unable to paint, which led her to her second suicide attempt. She was once again unsuccessful and so she decided to check herself into a mental hospital that provided art therapy. [54] [53] The art world had forgotten about Yayoi Kusama at that point, but she persisted and began once again creating art and re-establishing herself. She returned to the international art scene in 1989 with shows in New York City and Oxford and ever since has continued to create art that has been shown all over the world. [54] Today, at 90 years old, Kusama is the biggest-selling female artist in the world. [54]

The piece by Yayoi Kusama I chose to portray in the mini film is Infinity Mirrored Room — The Souls of Millions of Light Years Away created in 2013. This work involves a room covered in mirrors and a seemingly endless amount of lights within it. The reason for choosing Kusama's work, is that despite her relative fame, she has yet to achieve the same level of esteem as a lot of her male peers, including the ones who stole ideas from her. The mirrors will serve as a symbol of reflection of similar experiences that women have faced through the years of men over-looking, belittling or even stealing women's art. And the balls of light, meant to convey the hope for the future generation of female artists, that their work will have a light shined upon it, instead of being forgotten.
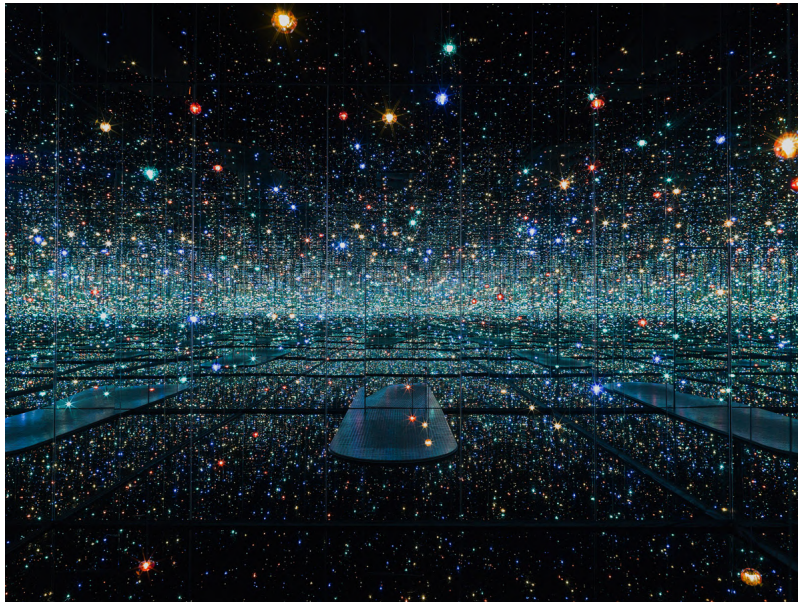
Figure 3.12: *Infinity Mirrored Room — The Souls of Millions of Light Years Away* (2013)
[55]

3.4   New Chosen Artists

In this section I will discuss the artists who I researched at a later point in the project.

3.4.1   Marina Abramović

Figure 3.13: Marina Abramović (1946 -)
[56]

Marina was born on November 30, 1946 in Belgrade, formerly known as Yugoslavia. The first years of her life were spent with her grandmother whose devotion to the Orthodox Church influenced Marina greatly.[56] After her younger brother was born, she moved in with her parents, and while her father was mostly absent, her mother had a rigid and stern approach to raising her children. Despite this Marina was encouraged to draw and paint as a means to express herself.[56] From 1965 to 1970 she studied at the Academy of Fine Arts in Belgrade and from 1970 to 1973 she furthered her studies at the Academy of Fine Arts in Zagreb where she stopped drawing and painting, instead using her body as a means to create art.[56] She traveled the world creating various works of performance art and even becoming a professor at Hochschule der Kunst in Berlin and at the Académie des Beaux-Arts in Paris. Marina continues to this day to create iconic works along with exhibitions and documentaries.[56]

The piece by Marina Abramović I chose to portray in the short film is "The Abramovic Method", more specifically the experience at SESC's community center in São Paulo, Brazil in 2015. An exhibition in which the visitors play a central role. Its main purpose is to make the audience mindful through a series of breathing, motion, and concentration exercises, most of which involve crystals. The reason behind choosing Marina and her work is due to the innovation and uniqueness of her work which goes beyond simply being art which can be seen and touched, but also experienced.

Figure 3.14: *The Abramovic Method* (2015)
[57]

3.4.2 Qing Han

Figure 3.15: Qing Han (1990 - 2020)
[58]

Qing was born on March 20, 1990 in Canada. Growing up in a strict household, she was not allowed to create art at home. Regardless, she began sharing her art on the website Deviantart where she amassed over 3.5 million views under the username "Qinni". [59] She is to this day looked upon as one of the most successful artists within the online art community and is credited with creating several viral artworks and reaction images viewed and shared by millions of people who more often than not, are unaware of who created them. Qing experienced many health issues which necessitated three open-heart surgeries and in the later stages in life, cancer. Her work often reflected the pain she experienced throughout her life due to her medical issues while still conveying he desire to create and share art with her community and the world. [59] She passed away at the age of twenty-nine in 2020. [59]

The piece by Qing Han I chose to portray in the short film is her 2D animation thesis film, "Night Light" released in 2012. It was chosen because after her passing, hundreds of artists around the world paid homage to the artist by creating art pieces depicting her likeness alongside the golden fish of her film. [59]

Figure 3.16: *Night Light* (2012)
[60]

3.5 Storyboard Prototype

Figure 3.17: Original Storyboard

3.6   Work Plan Prototype

Based on the work plan of the thesis proposal, I created a more detailed plan, describing the work that has been done and will be done in the following months. See figure (3.18) for the detailed plan.
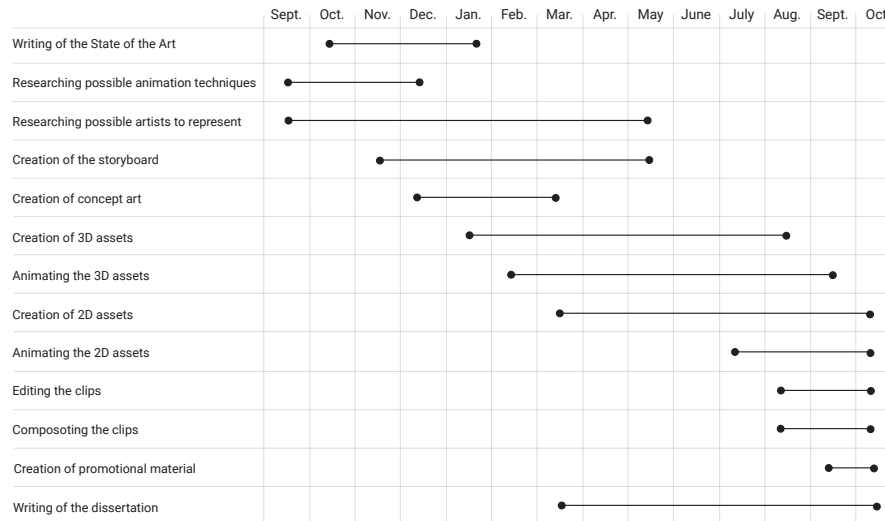

Figure 3.18: Work Plan

Starting with the finalization of the concept art to determine the art style, I will then start creating the necessary 2D assets, such as the main character which will be drawn in Adobe Photoshop and the Procreate app. When that is done, I will be animating them in After Effects and making sure that the movements are fluid. After that, the creation and animation of the 3D assets will begin in Blender. After they are rendered they will be imported to After Effects to integrate them into the video. When all the scenes are completed I will then join them and proceed to add sound effects. Once the short film is complete I will then create promotional contents for it, such as posters.

Chapter 4

Pre-Production of the Film

4.1 Introduction

Based on the feedback I received, I wanted to explore different artists and directions as well as ascertain if I could recreate the works that I'd chosen. To achieve this, I looked into artists whose work could be incorporated into the video from areas I had not previously considered, as well as, reconsidering some of the works chosen for certain artists. Subsequently, I had to reorganize and redraw the storyboard in order to accommodate these changes and decide on a color story for the film to follow.

4.2 Proof of Concept 3D Models

All the artists were chosen deliberately to ensure that the recreation of their works in a 3D environment would be possible. But despite this careful selection I still had to ensure that their creation was indeed possible. So I began by creating several proofs of concept models. This was helpful because it allowed me to visualize how the final product might look and how I would be restrained by the works in terms of 3D footage.

One of the first proof of concept created was Gunta's work, originally meant to function as a slide. But after recreating it in 3D it became clear that would not work unless I stretched the pattern to the point where it would be unrecognizable.

Figure 4.1: Proof of Concept: Gunta

Geng Xue's was one of the only artists who went through the Proof of concept phase practically unchanged, it was simply improved upon.
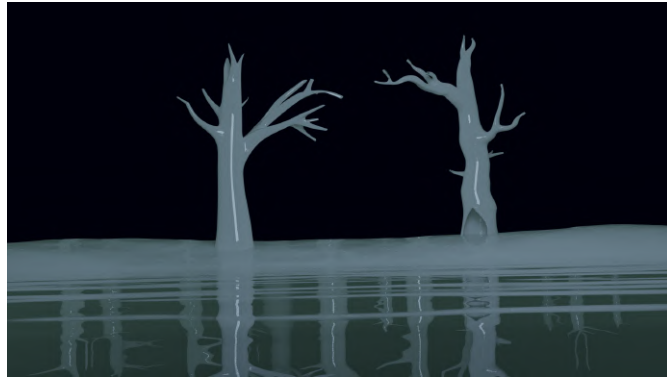

Figure 4.2: Proof of Concept: Geng Xue

On the other hand, Yayoi's work which was recreated by creating thousands of spheres and compositing them to glow, quickly made me realize that utilizing all these colors and making them interact would be very difficult.
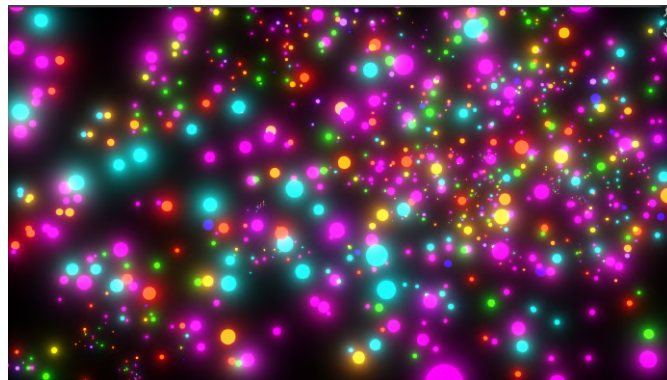

Figure 4.3: Proof of Concept: Yayoi

Berth's work was recreated by creating a corner of the room in the painting, and it became immediately apparent that this section of the film would necessitate major changes.

Figure 4.5: Proof of Concept: Berth side view

Figure 4.4: Proof of Concept: Berthe

4.3 Experimentation

Once I realized my limitations, both by time and skill level, it was time to see how far I could push them. After considering the feedback I received, I decided to research more artists in order to showcase a more diverse variety of art forms and to perhaps replace some of the other artists.

4.3.1 Louise Nevelson

One of the experiments was the recreation of Louise Nevelson's piece "Mirror Image, No. 1" as the cave. After creating an almost exact replica of the sculpture, I then sculpted it into the shape of a tunnel. This attempt to make it so the cave was the artwork went awry when the mesh became too complex and had too many problems to apply a texture to it as well as editing it became near impossible. The attempts to apply posters on the walls also failed so this experiment was scrapped.

Figure 4.6: *Mirror Image, No. 1* (1969)
[61]

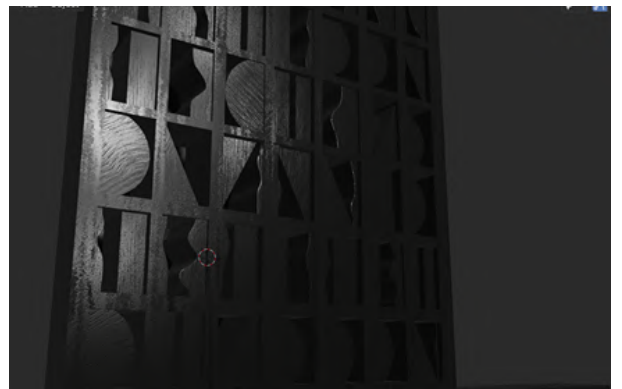**Figure 4.7:** Recreation of Louise's work

Figure 4.8: Recreation of Louise's work rendered

Figure 4.9: Louise's work as a tunnel
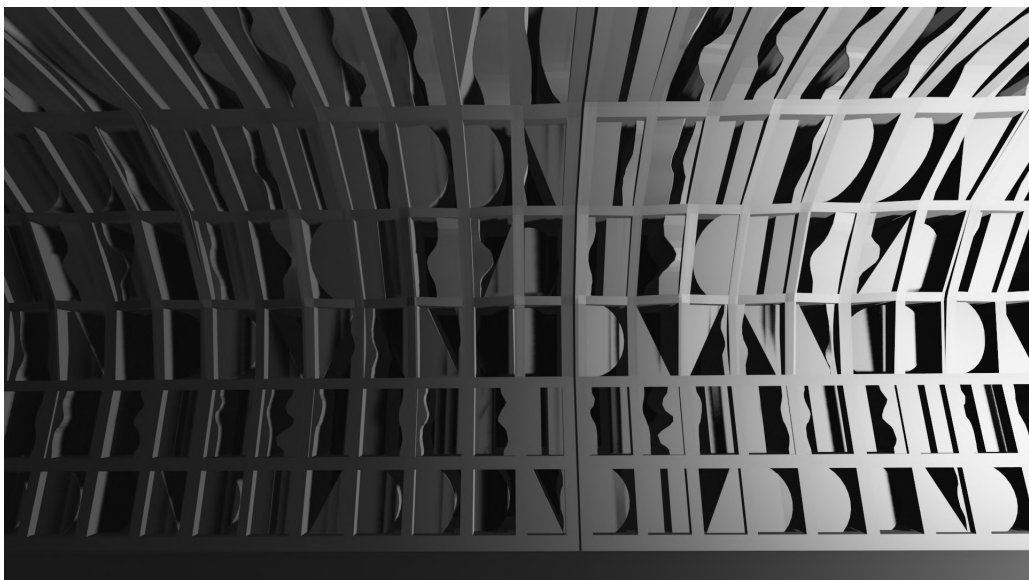

Figure 4.10: Louise's work as a tunnel

4.3.2   Helen Frankenthaler

Another experiment was replacing the room where Berthe Morisot's mirror would be placed and for this, I attempted to recreate a portrait of Helen Frankenthaler sitting on her paintings. Unfortunately, this set had a similar issue to the original set of Morisot's painting, where it was limited in terms of angles, so it was ultimately also abandoned.

Figure 4.11: Frankenthaler in 1956
[62]
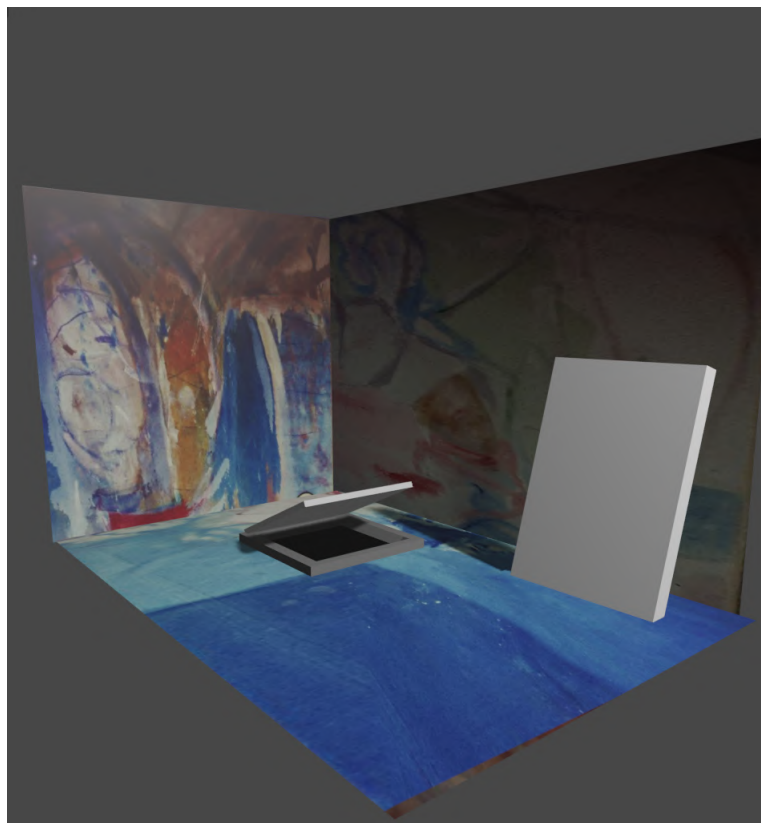
Figure 4.12: Recreation of Frankenthaler's painting

4.3.3   Barbara Kruger

Upon several attempts to utilize and stick the posters to the walls of different caves it occurred to me that I might be able to showcase the posters in a different way.
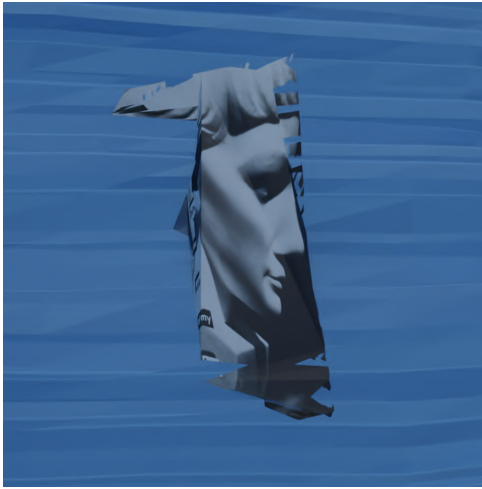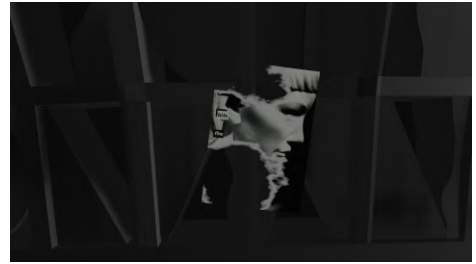

Figure 4.13: Poster on tunnel walk

Figure 4.14: Poster on cave wall

So I began to experiment with cloth physics in order to showcase the posters flying through the air. These particular animations were quite tricky to get right as you can control the environment that will affect the objects, but that won't always wield the desired animation.

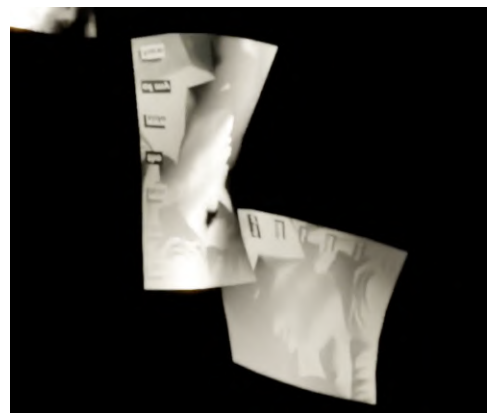**Figure 4.15:** Posters flying

Figure 4.16: Posters falling

4.4   Creation of 2D Assets

The Procreate application was used to create 2D assets such as the drawings of the museum, statue, and character design. In this section I will discuss the inspiration and reasons behind the aesthetic choices.

4.4.1   Backgrounds

Observing and studying several references of various museums such as The Louvre and Metropolitan Museum of Art, I drew and redrew a hallway with paintings on either side framing the main piece of the scene, the statue. This statue was also referenced from actual existing statues such as "Undine Rising from the Waters" by Chauncey Bradley Ives and "Rhodopis" by Charles Francis Fuller.

Figure 4.17: Concept art of the Museum

4.4.2   Main Character

The design of the main character underwent several alterations, a majority of these changes were out of necessity. The first and most noticeable one was the foregoing of the line art, this enabled the animation of the character to be vastly simplified as there was no need to redraw the lines, which required a lot of time and precision, multiple times throughout the film. Other smaller changes were changes in character design such as removing the headband, a detail that added nothing, as well as all the shading running through the hair.
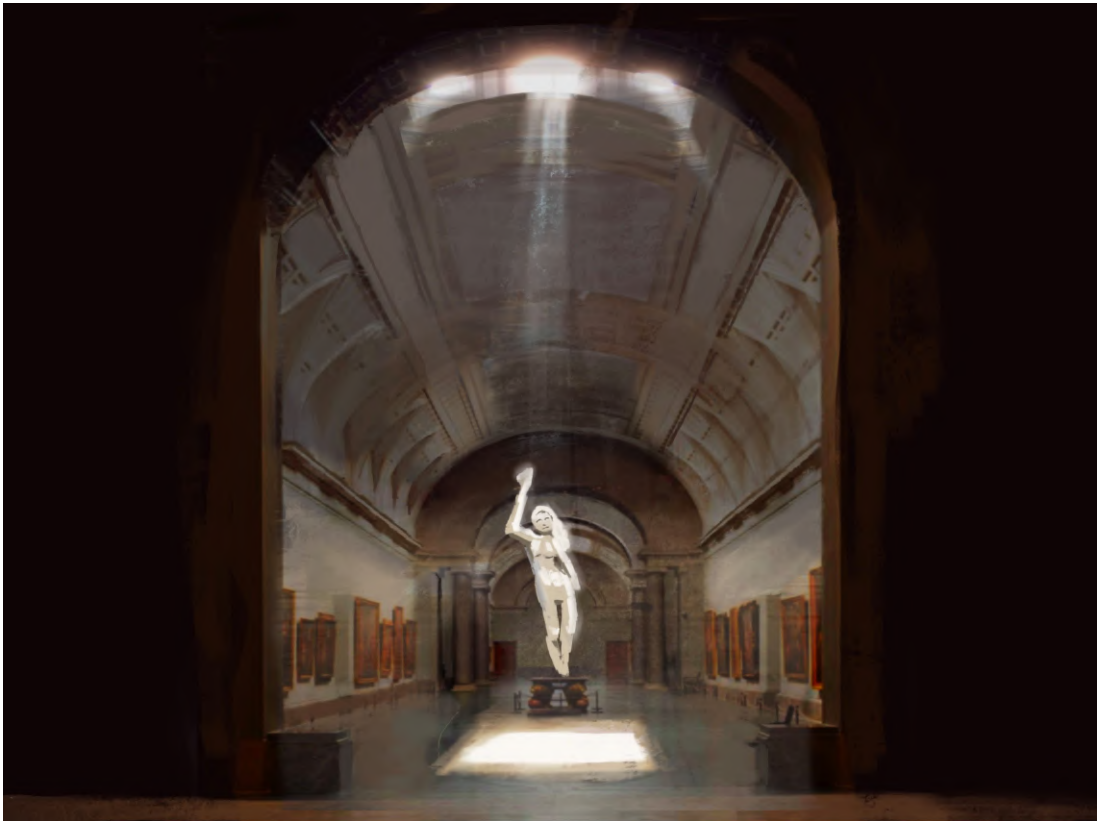
Figure 4.18: First attempt at creating the Museum

Figure 4.19: Final version of the Museum

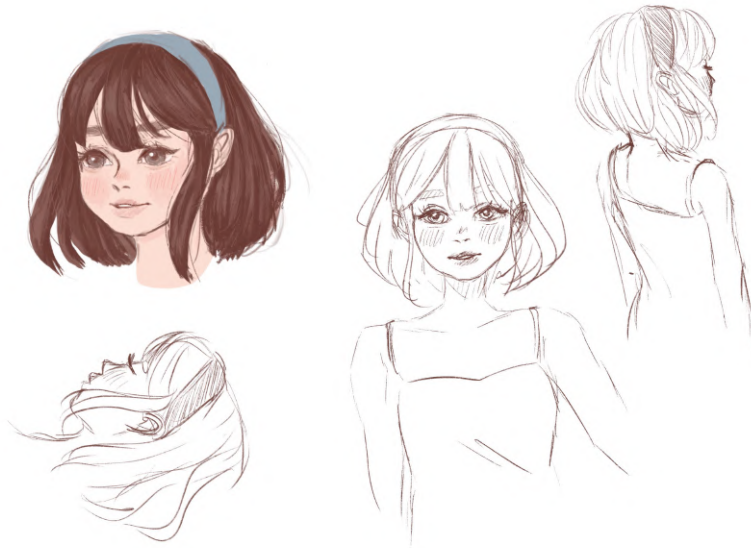**Figure 4.20:** Concept Art: First main character sketches

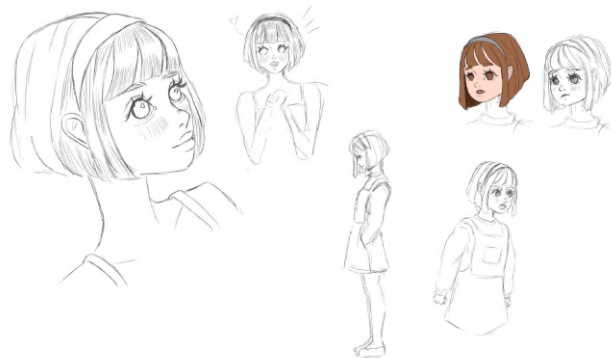**Figure 4.21:** Concept Art: Second main character sketches

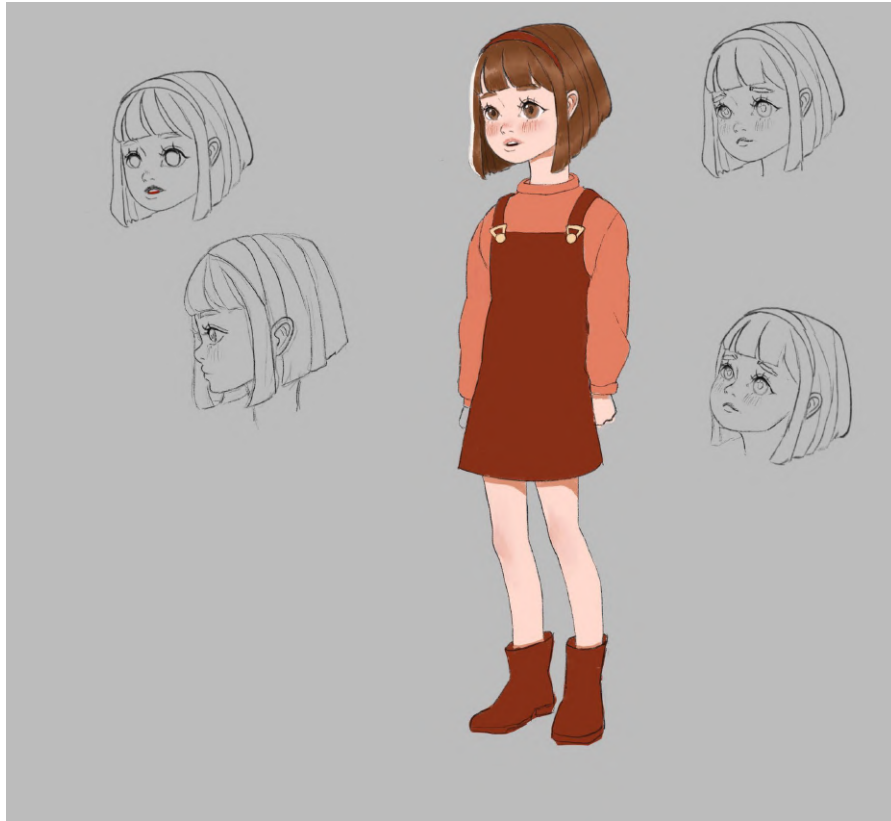**Figure 4.22:** Concept Art: Third main character sketches

Figure 4.23: Final Art: Original Character concept

Figure 4.24: Final Art: Final Character concept

4.5   Color Story

Throughout the film, our main character traverses through a series of environments, all of which, convey the emotional journey she experiences. When completed she exits the world as someone who is capable of not only being the subject of art but also someone who can create it, like those who created the artworks surrounding her. Color is thus used as a tool to also express the character's emotions, starting off in Geng Xue's blue ceramic forest, the color blue represents the characters gloominess and her uncertainty, or as Patti Bellantoni describes it: "Blue can be a tranquil pond or a soft blanket of sadness. It is quiet and aloof. Year after year, our color investigations show that in a blue environment, people become passive and introspective. It's a color to think to, but not to act."[63, page 82]

The blue continues to follow her through Helena Almeida's work as she opens it along with herself to new possibilities and then also through Marina Abramović's crystal's illuminating her way through the cave. It is in this cave that she encounters Berth Morisot's mirror and also, herself. Through this examination of her reflection, she realizes that she herself is capable of creating. She falls through this realization into a new color.

"Orange manifests its influence in a different way from the other colors. While red says "I'm here!," yellow is exuberant, and blue is laid-back, our research revealed that orange is generically "nice". [...] The color simply supported a warm and welcoming congeniality." [63, page 111]

As such, our character leaves behind her negative and cold feelings regarding the sexism in the Art community, and instead looks forward to what has and can be created regardless of the traditional methods of artistic acclaim. She literally falls into this new manner of thinking, supported by Gunta Stölz textile artwork, which at the time of its creation was dismissed as not real art, acting as a make-shift parachute, safely guiding the character to even ground. On the way down, she views the magic and whimsy of Qing's flying fish, not bogged down by the conventional definition of success in art.

Finally, our main character is confronted by the work of Yayoi Kusama, hundreds of warm orange lights serve as a representation of the character's enlightenment.

4.6   Artist and Artwork Changes

After the proof of concept for the 3D models was mostly done as well as some experimentation, it was time to make a final decision in regard to which artists would be represented. I knew I would have to replace certain artists and artworks and after some further research, I ultimately decided to add two more artists whose area originally went unrepresented.

4.6.1   Barbara Kruger

Originally, Barbara's poster was meant to be placed on the cave walls. After several failed attempts at placing them on two different cave walls, I then proceeded to attempt a physics simulation with the posters by giving them cloth physics and then strategically placing wind vortexes for these to fly. While the results were satisfying, I realized there was a big incongruence between this 3D recreation and the other artworks. Namely that all of the other artworks went under varying degrees of transformation where it still resembled

the original work but it was never a direct copy of the art itself. This along with the fact that it did not particularly fit in anywhere within the chosen color story I had decided upon for the film, I ultimately decided to scrap it.

4.6.2   Marina Abramović

Unlike all the other artists, Marina's work can be difficult to label and define to some. She mixes a variety of mediums in order to represent her artistic vision. But all these mediums are ultimately a way to truly showcase her artistry, which is performance, which was overlooked in the first lineup. I chose to represent "The Abramovic Method", by recreating the crystals she utilizes in the exhibition, which play a big role alongside the breathing exercises.

4.6.3   Berthe Morisot

After creating the proof of concept for Berthe Morisot's original piece, which was created by creating and editing planes which were extruded in order to match both the mirror and wall, it was obvious that it had a glaring problem. Even after the reconstruction of the image, there was still not enough of the room in the painting to be able to recreate it in 3D to the necessary degree. The slightest camera angle change immediately ruined the illusion of the 3D set. There was also not enough of the mirror visible in the painting to simply recreate it. Despite this issue, I still wanted to use her work and the concept of the mirror as a portal, so after researching and analyzing her other paintings a different one, which also contained a mirror, was chosen. "The Cheval-Glass" also known as "La Psyché" was painted in 1876. It was chosen because this painting, unlike the one I had chosen originally, features a full-length mirror that I could more easily recreate in 3D.

Figure 4.25: *La Psyché* (1876)
[64]

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4.6.4 Qing Han

Qing Han was added in order to represent the digital art medium, one that not only was overlooked with the original lineup of artists but is also one that is regularly dismissed as "not real art". But digital art, as well as new ways to share art online, has opened many opportunities for female artists whereas before the circulation of art was very closed off to women, online art circles such as the ones Qing shared her art in, allowed her to amass a lot of fame and recognition. As such, one of her most famous works, a 2D digital animation was chosen, in which Qing depicts a school of golden fish flying through the night sky.

4.6.5 Yayoi Kusama

The original chosen piece by Yayoi Kusama's was modeled as a proof of concept, while it was a success it also made it clear that the reflections of all the different colored lights would be extremely difficult to recreate in 2D when drawing the main character. Therefore a different installation was chosen, one that retained the original theme necessary, one of light in order to represent enlightenment, but that did not contain as many different colors. The installation chosen was "Aftermath of Obliteration of Eternity", which is similar in concept but the lights are simply one color that matched the necessary color in the aforementioned color story.
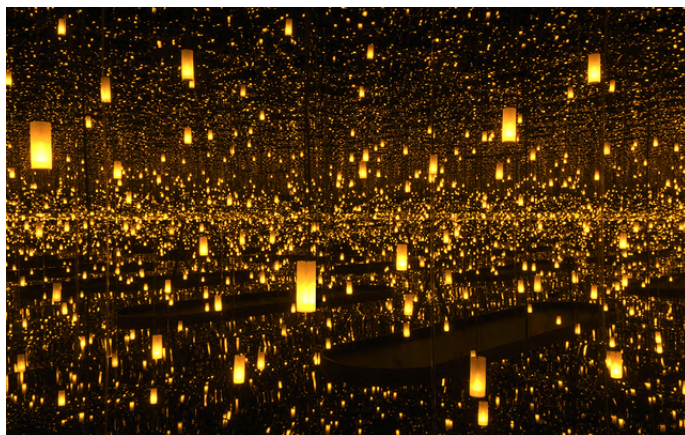

Figure 4.26: *Infinity Mirrored Room—Aftermath of Obliteration of Eternity* (2009)
[?]

4.7 Storyboard Changes

Because of these artists' changes, the storyboard had to be modified, more specifically the sections containing Barbara's, Berthe's, Gunta's, and Yayoi's. Barbara's original section which consisted of a cave covered in posters with a door which lead to a room with Berth's mirror, but given that Barbara's artwork was scrapped entirely from the film, the idea of a different room was also scrapped and I chose to simply place Berthe's mirror inside the cave. In regard to Gunta's work, while originally her carpet was meant to be used as a slide, but given the length of the original work, this would force me to either stretch the pattern or repeat it and neither option was satisfactory as it either made the artwork unrecognizable or visually unappealing. After a lot of deliberation, I eventually decided she could use the weave work as a parachute which would keep the original size and would demand the repetition of the pattern. I also had to seamlessly fit in the new art

by Marina and Qing in the film. For Marina's crystals I decided the best place would be in the cave given its color and for Qing's fishes because they were orange I knew they had to come after the scene involving the mirror so to place them as the character fell using Gunta's work as a parachute felt the most natural. Yayoi's scene was the only one who fundamentally remained the same despite the artwork change, the only difference being the usage of mirrors to give the illusion of many lights as opposed to simply creating them all. And finally, to take away focus from the institution whose bias inspired this entire short film, I decided to cut the final scene which brought back our character into the museum and have it instead end with credits depicting the artwork next to a portrait of each artist with the name and dates of birth.

4.8   Final Storyboard
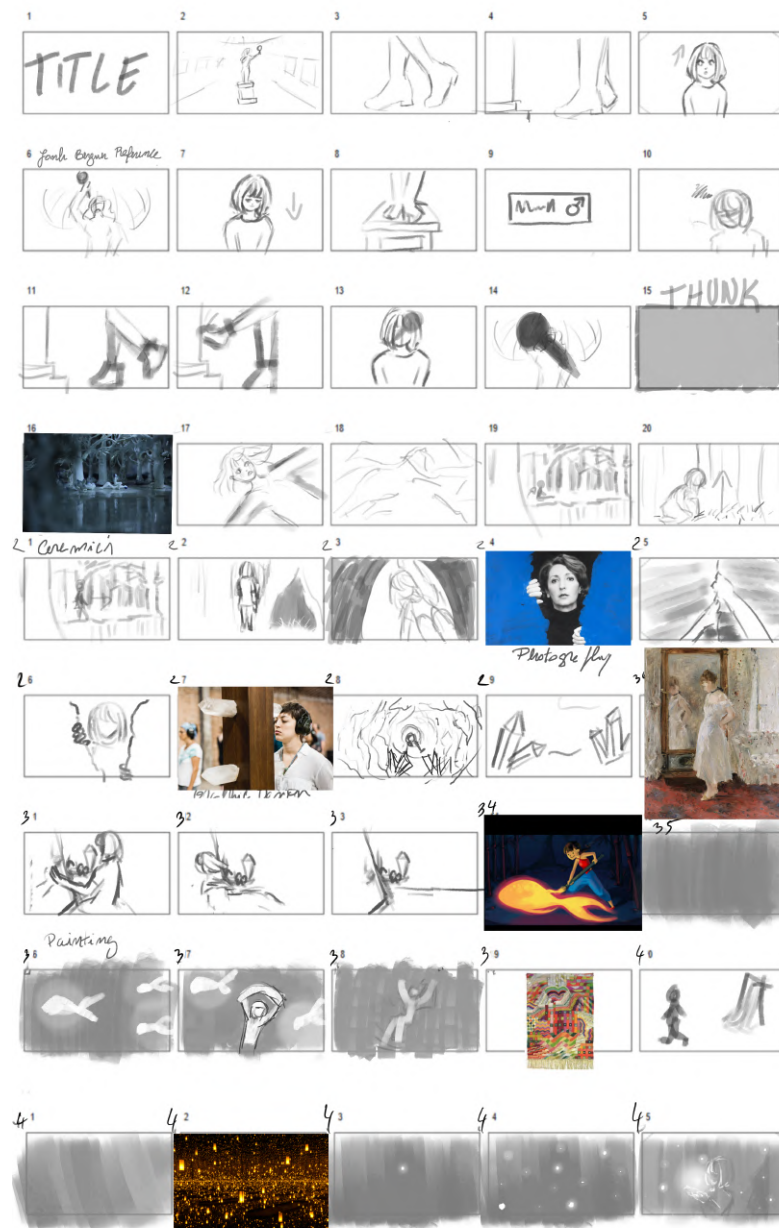
Figure 4.27: Final Storyboard

4.9   Conclusion

This phase was the most challenging creatively speaking. It required quite a lot of research and then many attempts in order to create a proper narrative that I felt i was capable of bringing to life. It also required quite some time to create all of the necessary illustrated assets, but was ultimately completed withing the expected time frame.

Chapter 5

Production of the Film

5.1 Introduction

After the final lineup of artists was chosen and the storyboard was drawn, it was time to begin creating the final assets and animating them. Beginning with the 3D assets by modeling, texturing, and animating them in order to have the necessary scenes to animate the 2D character.

5.2 3D Modelling

3D modeling is the art of creating objects with a surface that consists of vertices, faces, and edges. For the majority of the objects in this work, the technique used to create them is named mesh modeling. Mesh modeling usually begins by utilizing a mesh primitive, (a cube, sphere, cylinder, or plane), which is then edited into a more complex shape utilizing the editing tools. This is done in order to keep the object as simple as possible in terms of the number of polygons, because the more complex and detailed an object is, the harder it is to edit and render. But this simplicity leaves the objects looking very low in quality or they are usually referred to, "low-poly". In order to eliminate this look, we utilize Shade Smooth, which smooths the appearance of the object without actually changing the geometry of the object. There are also modifiers which are "automatic operations that affect an object's geometry in a non-destructive way", meaning they change the way an object is displayed and rendered, but not the geometry of the object itself.

5.2.1 Building Geng Xue's forest as 3D objects

Starting with a cube, while keeping in mind the general shape of the trees in the original piece, I modeled several trees by creating and then extending the appropriate faces and then forking these in order to create branches.

This resulted in a low poly version of the necessary trees, so in order to recreate the smoothness of the porcelain, I utilized Shade Smooth and adjusted the shape as necessary.
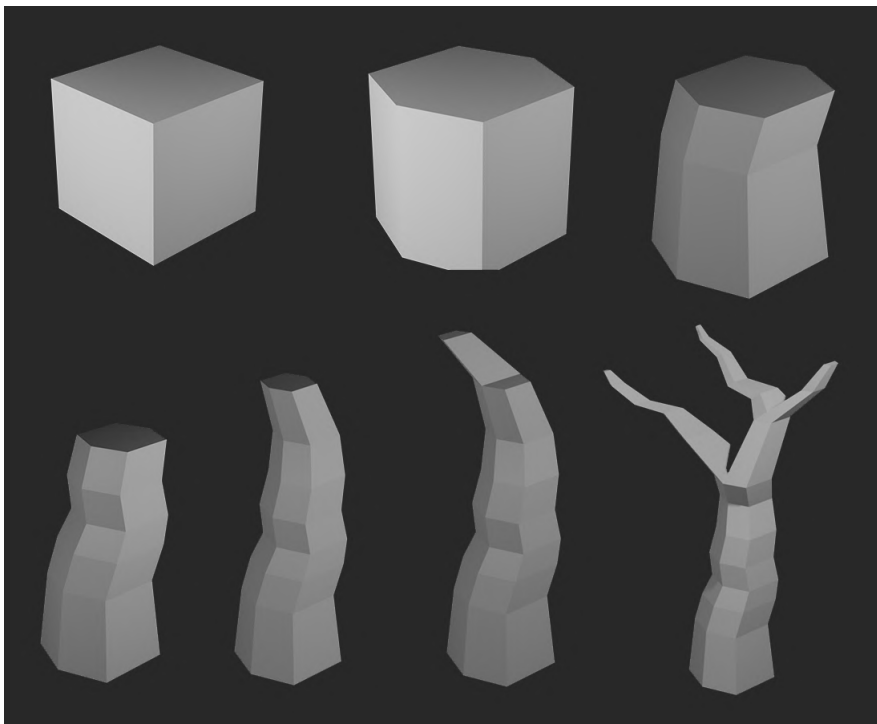
Figure 5.1: Modeling: Trees

Figure 5.2: Modeling: Tree with no modifiers

Figure 5.3: Modeling: Tree with modifier

Originally there were 7 different trees, these were duplicated and rotated and sized for variety until there were 20 of them. Unfortunately, that was not enough to create the illusion of a realistic forest. So this process was repeated several times in order to create enough variety and quantity in trees for the background. In total there are approximately 150 trees.
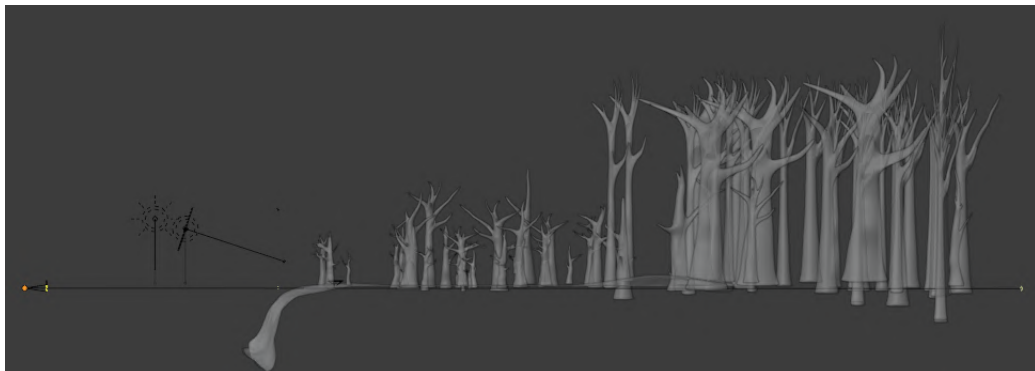

Figure 5.4: Modeling: Side view of the scene

The next step was creating the floor and water both of which started off as planes and were subdivided. The ground plane had two modifiers applied to it, one to subdivide it and another which added a cloud texture to make the floor look more natural. Then it was sculpted in order to create uneven flooring and the shore.

There was also an attempt to include fog, which in terms of modeling simply consisted of a cube that designated the area in which the fog would be contained.

Figure 5.5: Modeling: Bird's eye view of the scene
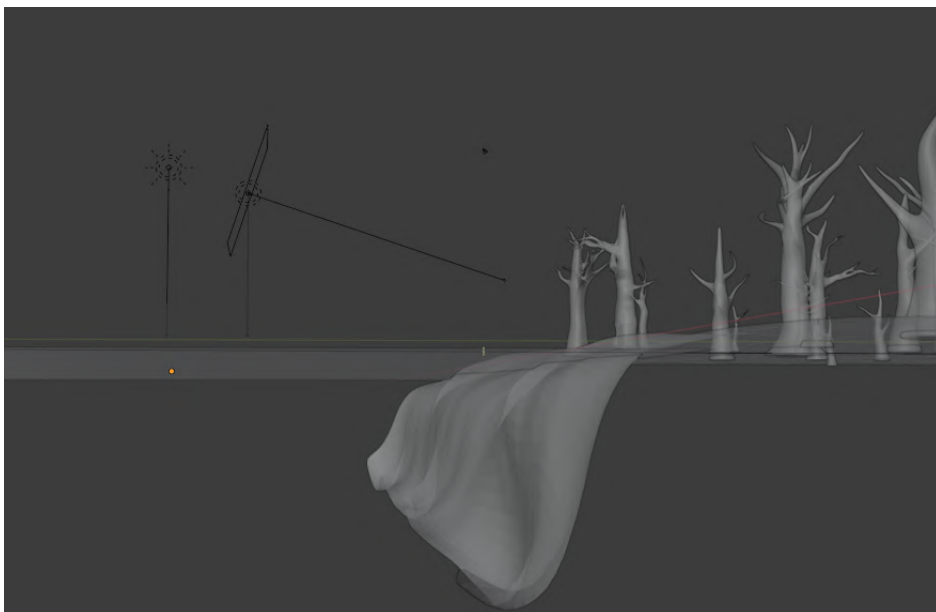
Figure 5.6: Modeling: Sculpted shore
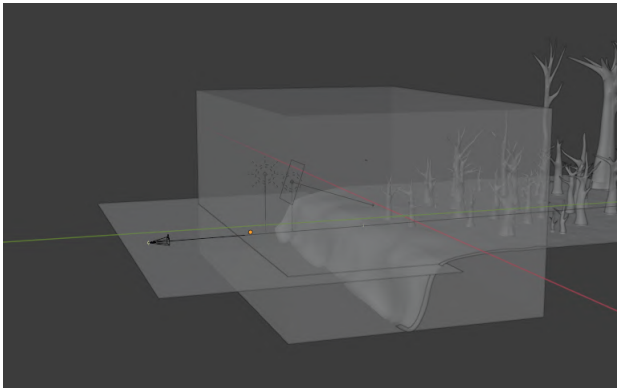
Figure 5.7: Modeling: Shape of the fog
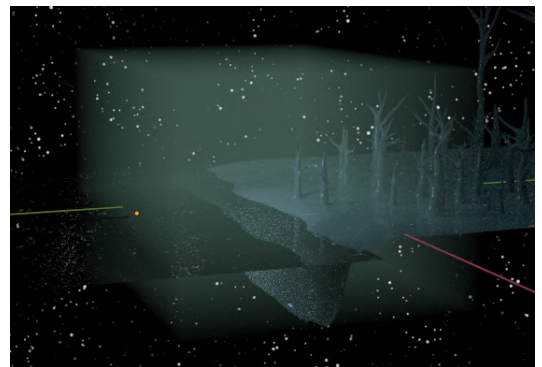
Figure 5.8: Modeling: Fog Rendered

5.2.2   Creating the painted portal of Helena Almeida

To create the amorphous shape in Almeida's work, I began by picking a tree from Geng Xue's forest and cutting a hole in the mesh of the trunk. Then with a plane that was modeled to fit within the hole created in the trunk of the tree, I proceeded to extend the plane in order to make it have width.

In the next scene, the mesh of the shape was then divided in two in order to be able to animate its opening.
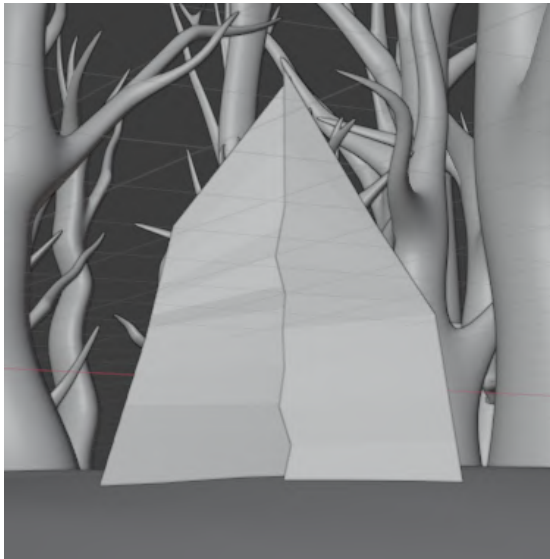
Figure 5.9: Modeling: Portal

Figure 5.10: Modeling: Side view of the Portal

5.2.3 Creating the Cave and Crystals of Marina Abramović

The cave that houses Marina's work was created by creating a bisected shaft shape which then utilized several modifiers to emulate the rugged look of the inside of a cave.
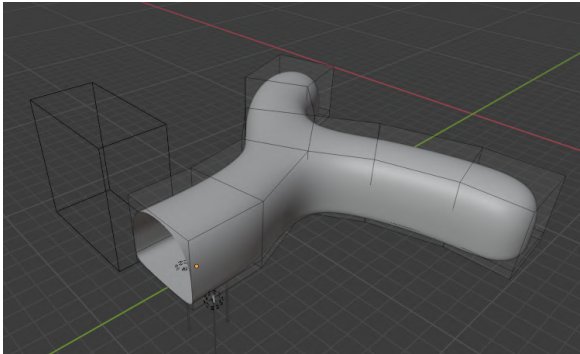
Figure 5.11: Modeling: Tunnel with no modifiers
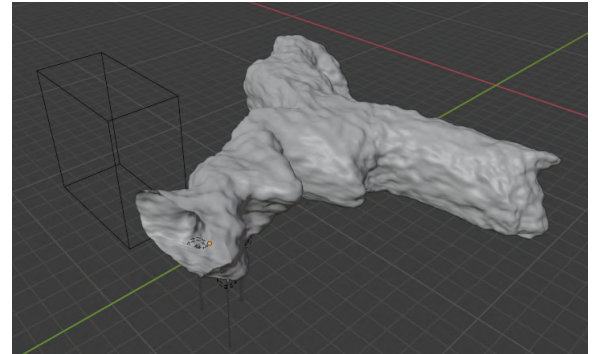
Figure 5.12: Modeling: Tunnel with modifiers

Because of this method, the texture of the cave is actually procedurally randomized and was made in such a way that it can be easily changed by moving a cube, who acts as a controller, to achieve the desired look.
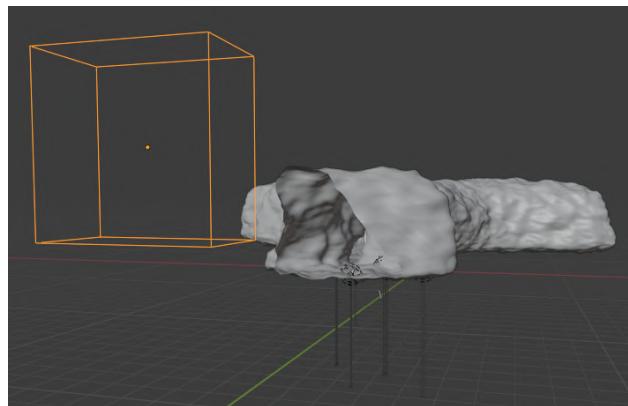
Figure 5.13: Modeling: Original cave shape
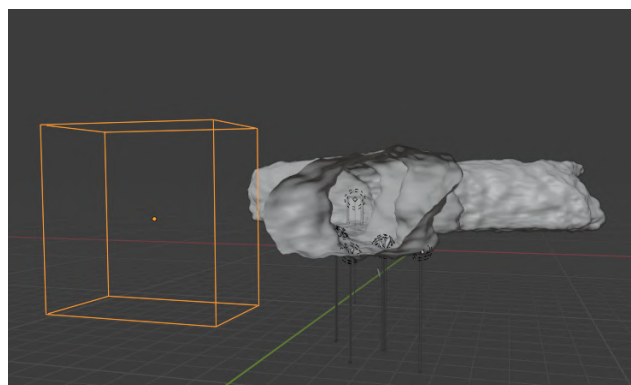
Figure 5.14: Modeling: Cave shape modified by moving cube

The crystals started off as a circle whose vertices were changed from 32 to 5, making it a pentagon. All the edges were then selected and extruded to a satisfactory height and then extruded once again to connect at the center. The same process was replicated a few more times with some changes to height and width and the crystals were formed.
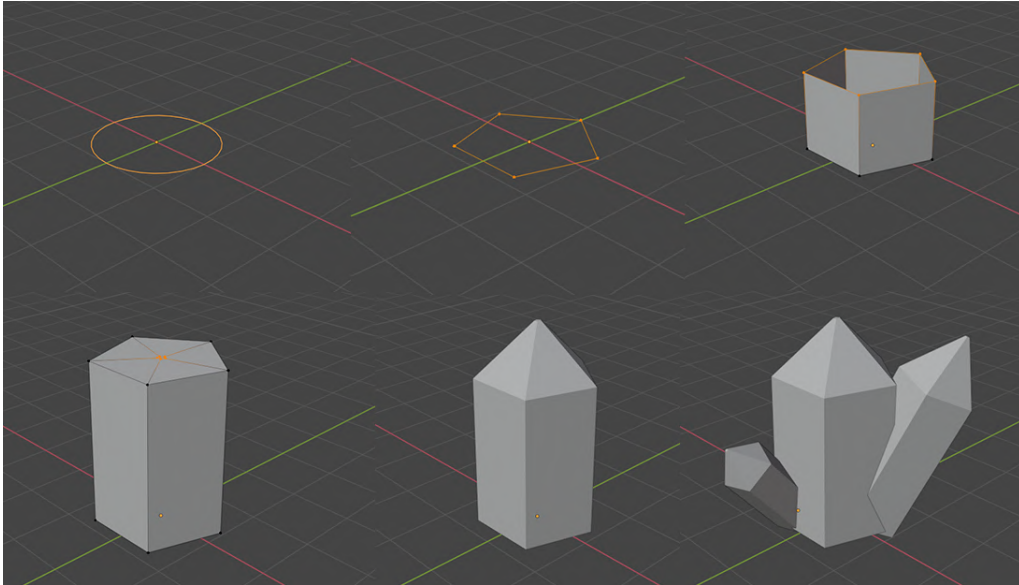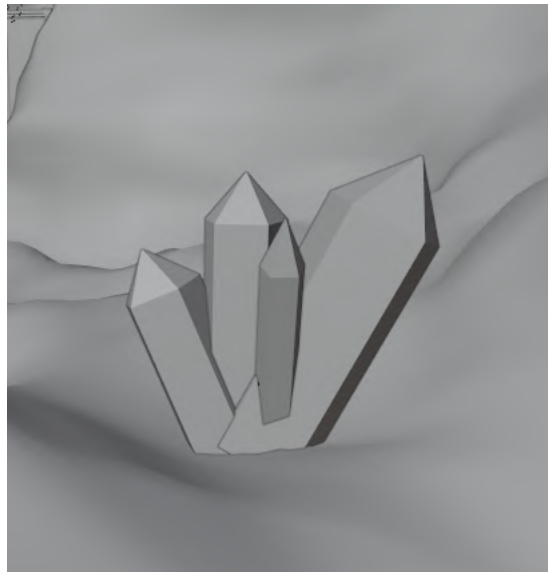

Figure 5.15: Modeling: Crystals

Figure 5.16: Modeling: Crystals in the scene

5.2.4   Creating the Mirror of Berthe Morisot

Referencing the mirror in Morisot's painting, the general shape of it was recreated by utilizing a cube and extending it in a cuboid shape. The necessary faces were cut, creating more faces that were then extruded to create the wood detailing.

The legs of the mirror were created with great detail by customizing the profile of the bevel.

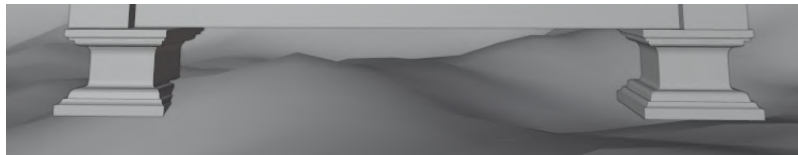**Figure 5.17:** Modeling: Mirror in the scene

Figure 5.18: Modeling: Bevels in the scene
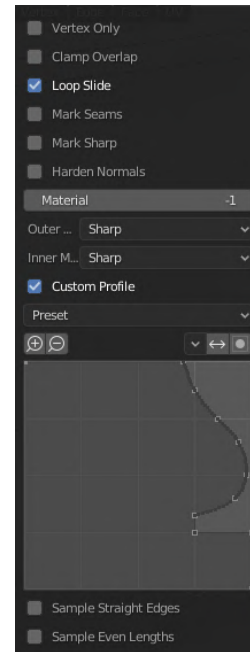
Figure 5.19: Modeling: Bevels

Figure 5.20: Modeling: Bevel Settings

5.2.5 Creating the Weaving of Gunta Stölzl

The weaving of Gunta was the most simple object to model in this project. Starting with a cube, it was then extended and resized to create a very thin cuboid shape. This shape was then subdivided several times in order to allow the shape to move as if it were fabric during the animation process as well as, shaded smooth in order for the polygons to not appear pronounced during said movements.
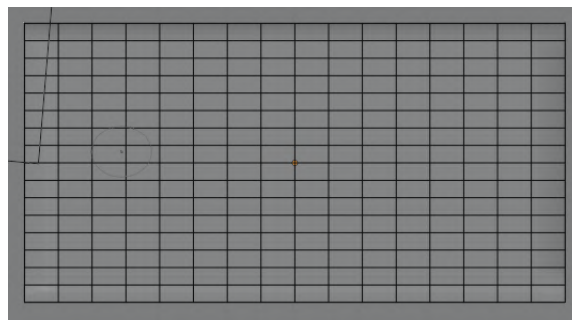

Figure 5.21: Modeling: Weaving

5.2.6 Creating the Fish of Qing Han

Using references of real fish and the artwork by Qing, a low poly plane was created that resembled the side profile of a dish. This plane was then extended to make it have width and rounding it. Then, it was shaded smooth to make the shape appear more natural. The fish was then copied and pasted with different sizes and starting points in order to emulate a natural school of fish.
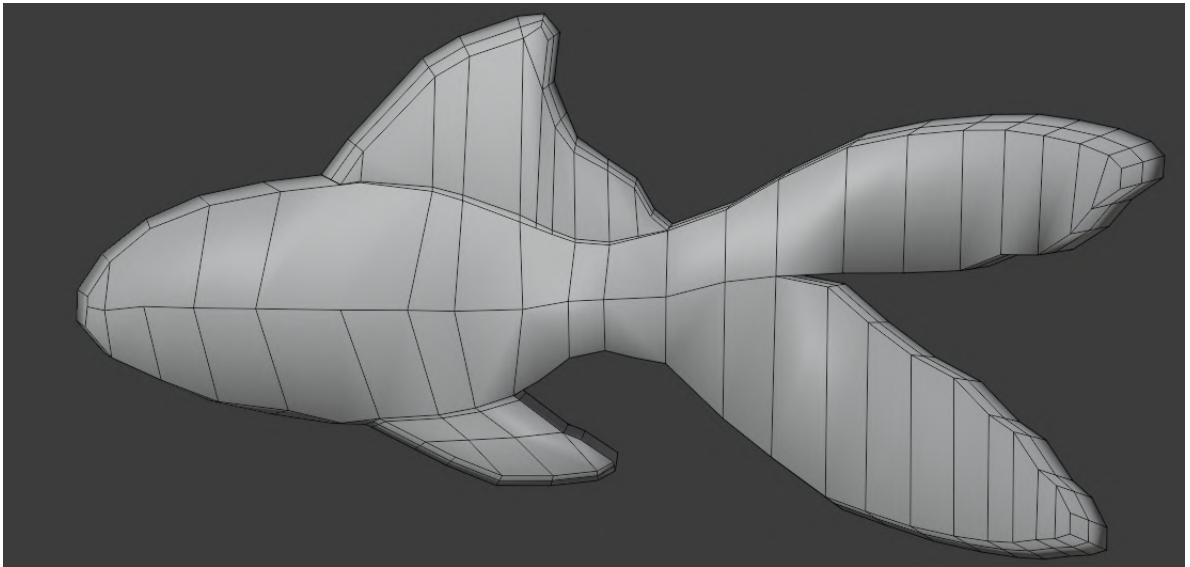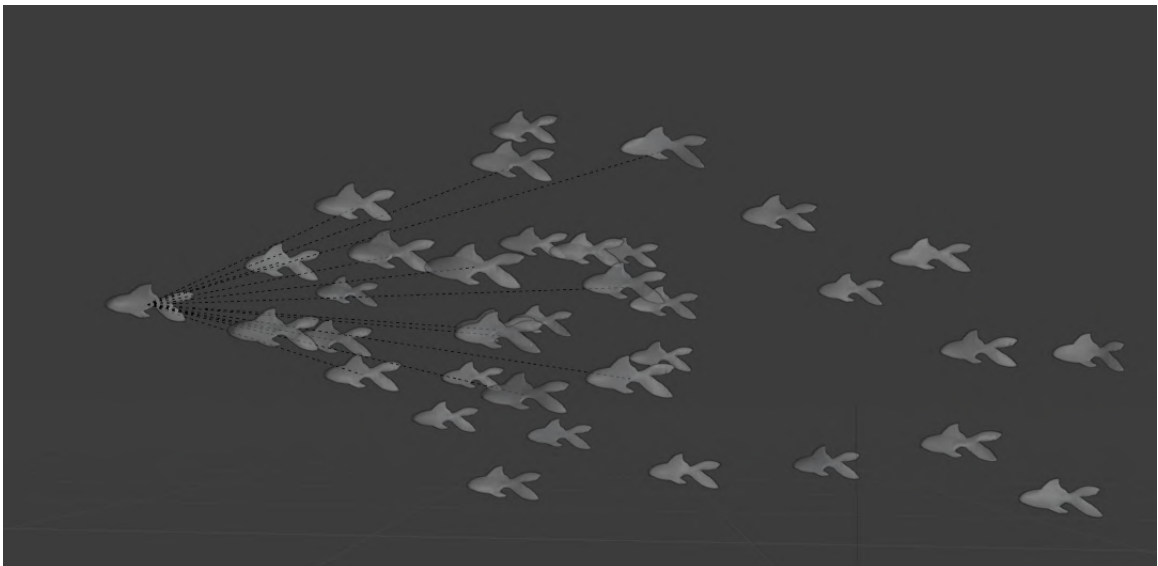
Figure 5.22: Modeling: Fish

Figure 5.23: Modeling: School of Fishes

5.2.7   Creating the Lights of Yayoi Kusama

Yayoi Kusama's work presented a series of challenges. While the lanterns themselves were relatively easy to model, there is a limit of lights allowed within the Blender program. Therefore I began by modeling the lights by creating cylinders with lights inside them and then created 6 walls of mirrors, each wall consisting of a normal plane and a Reflection plane. This was done in order to give the impression of more lights, thereby emulating the construction of the original installation artwork.
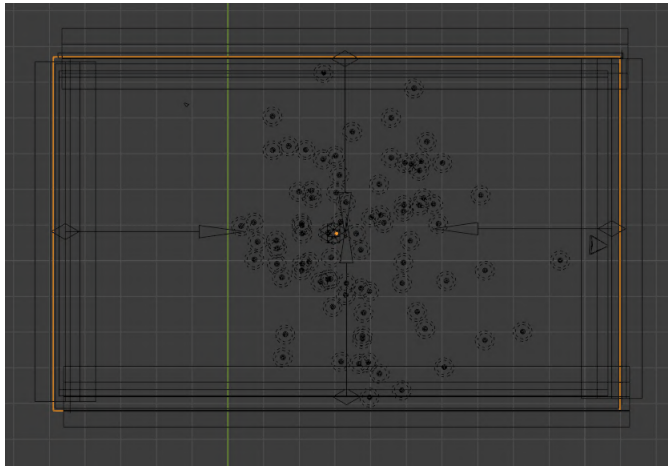

Figure 5.24: Modeling: Birds eye view
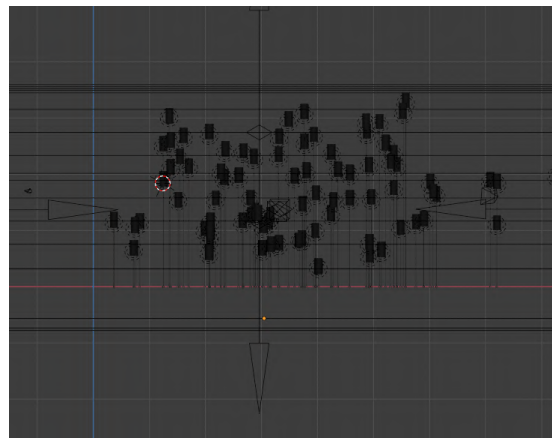

Figure 5.25: Modeling: Lantern

Figure 5.26: Modeling: Side view

5.3 3D Materials

Materials are composed of three shaders: The surface shader, the volume shader, and the displacement shader. Meaning, the materials can alter the texture, color, and even shape of the object itself. Not only can users apply pre-made materials as well as edit them through sliders, it is also possible to use the node editor. The node editor is, essentially, a data-processing pipeline that allows for the flow of data from various source nodes, through data processing nodes, and finally to output nodes. Each node controls a specific change in the material, allowing the user to make tailor-made and extremely complex materials. I utilized the node editor to create every material in the film, and in this section, I will explain how these were made.

5.3.1 The Materials of Geng Xue

In the forest of Geng Xue there are three shaders, one for the porcelain which is attributed to all of the trees and floor, and another for water attributed to the plane near the edge of the floor. And finally, there is the shader for the stars which unlike the previous two is not attributed to a specific 3D object but rather the world, making it a world shader.

The porcelain mostly consists of a mix of subsurface scattering nodes along with a Diffuse node and a Glossy node, the Glossy shader allows for the material to reflect light while the subsurface scattering, also known as subsurface light transport, shows when the light goes through an object and is scattered exiting the surface of the object in different points.
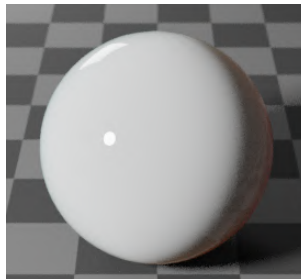

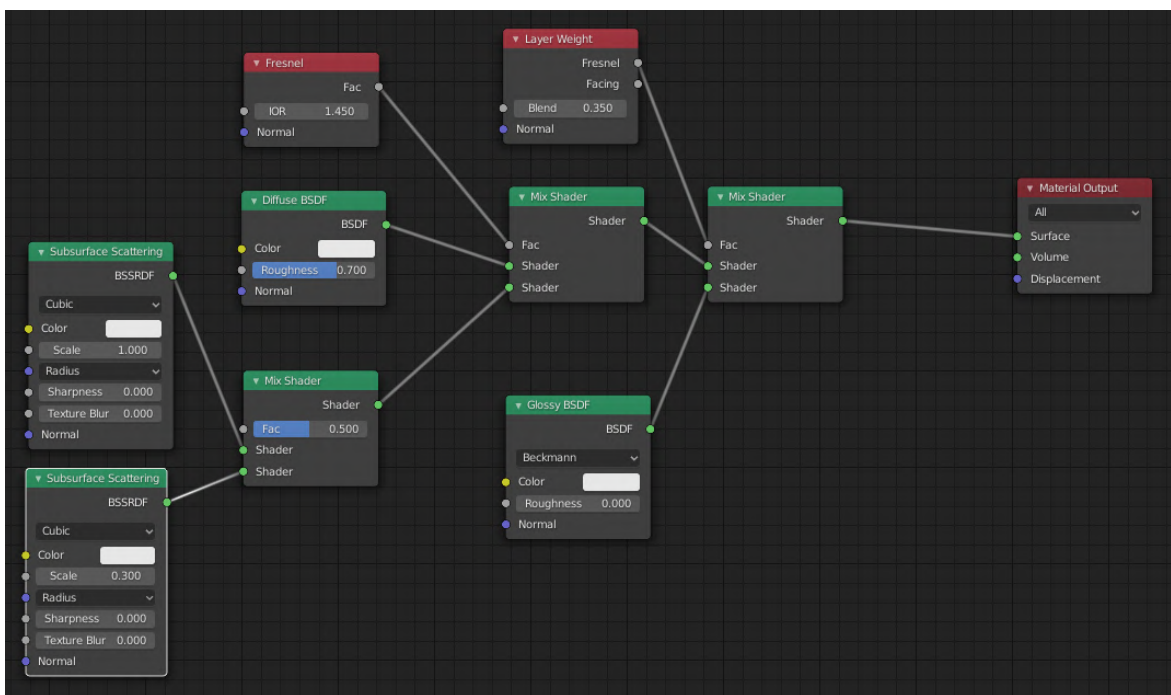**Figure 5.27:** Porcelain Material

Figure 5.28: Nodes of the Porcelain

The water material mainly consists of two mapping nodes each attached to a noise texture node along which when combined with the bump node allows for the waves to be created while in the Principled node the lack of roughness and high transmission permits the shader to be highly reflective therefore emulating the surface of water.
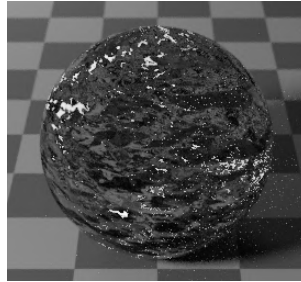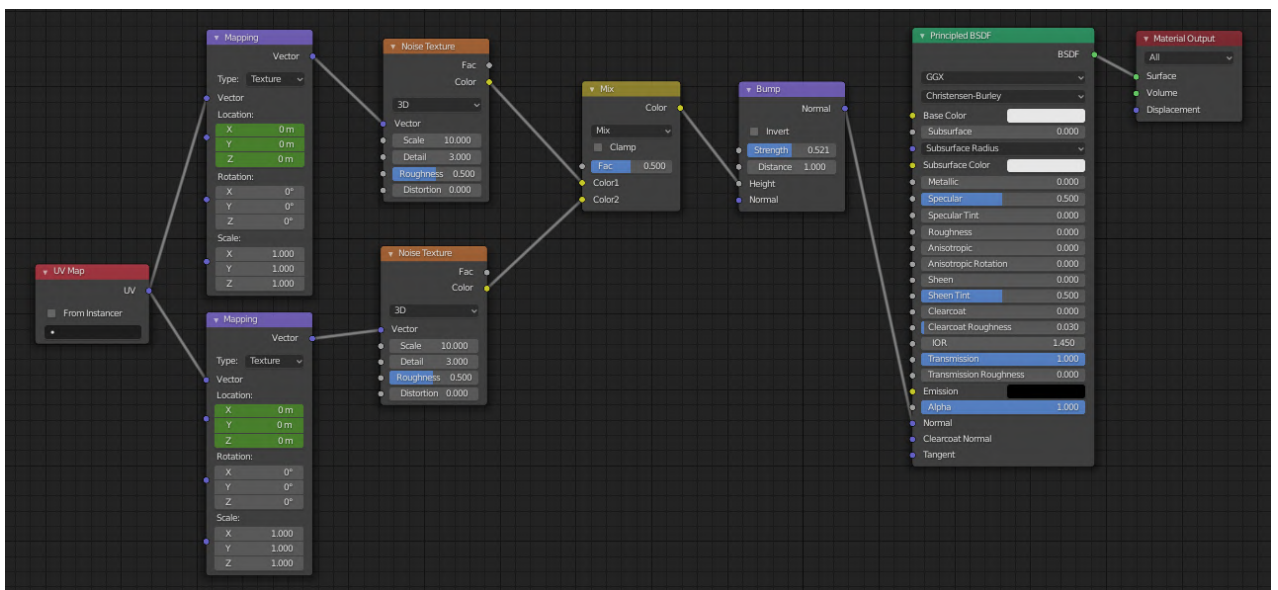

Figure 5.29: Water Material

Figure 5.30: Nodes of the Water

Finally, the world shader, responsible for the stars, is composed of three main node groups composed of a Voronoi texture using the Euclidean distance metric, Map Range, and a Value node. These create the clusters of stars all of which have different values that control the different sizes of stars.
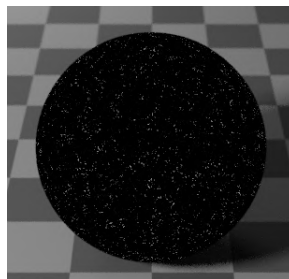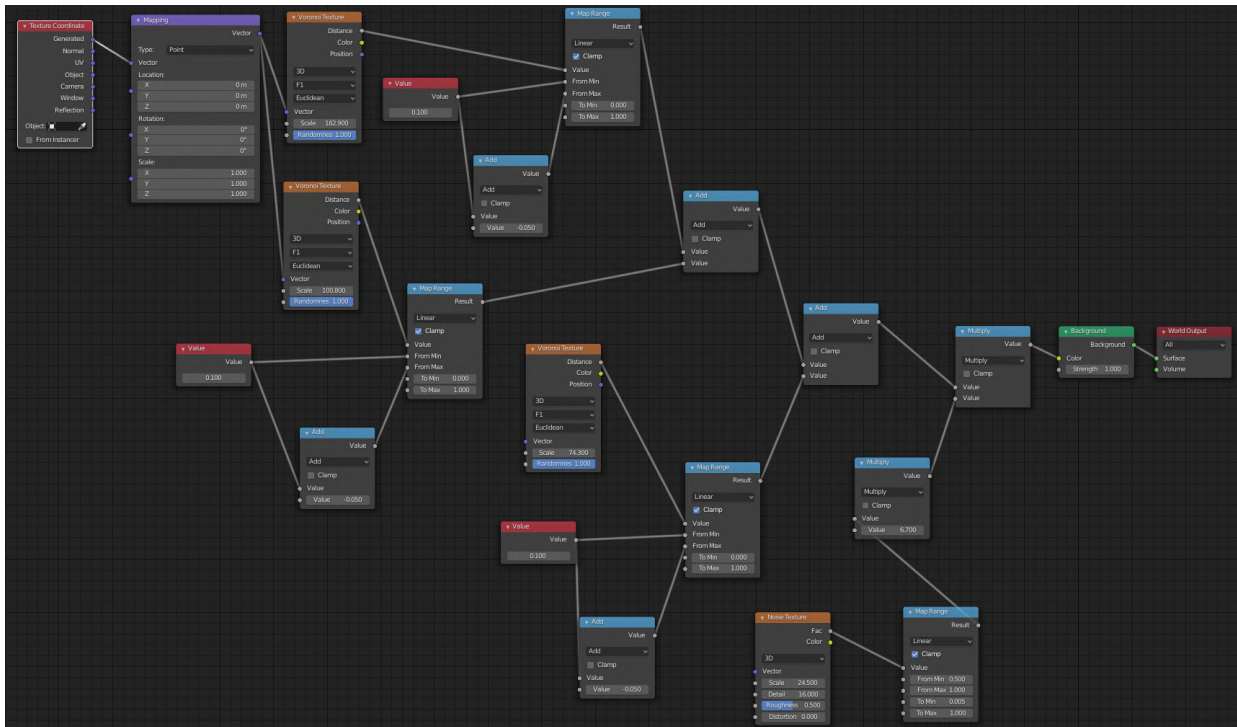

Figure 5.31: Night Sky Material

Figure 5.32: Nodes of Night Sky

Figure 5.33: Final Render of the Forest

5.3.2 The Materials of Helena Almeida

A single shader was used to emulate the roughness of the paint strokes in Almeida's work, this was based on Simon Thommes's Procedural Noise Pack [65] which was then tweaked by adding and removing several nodes. The end result utilizes a Noise Regular node along with a Musgrave Texture node with the type: Fractal Brownian Motion. These, combined with the Bump and Displacement node, create the texture while the ColorRamp node controls the color.
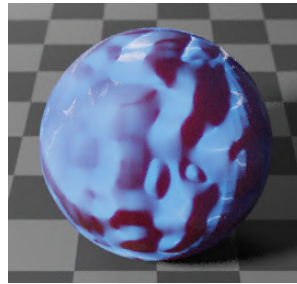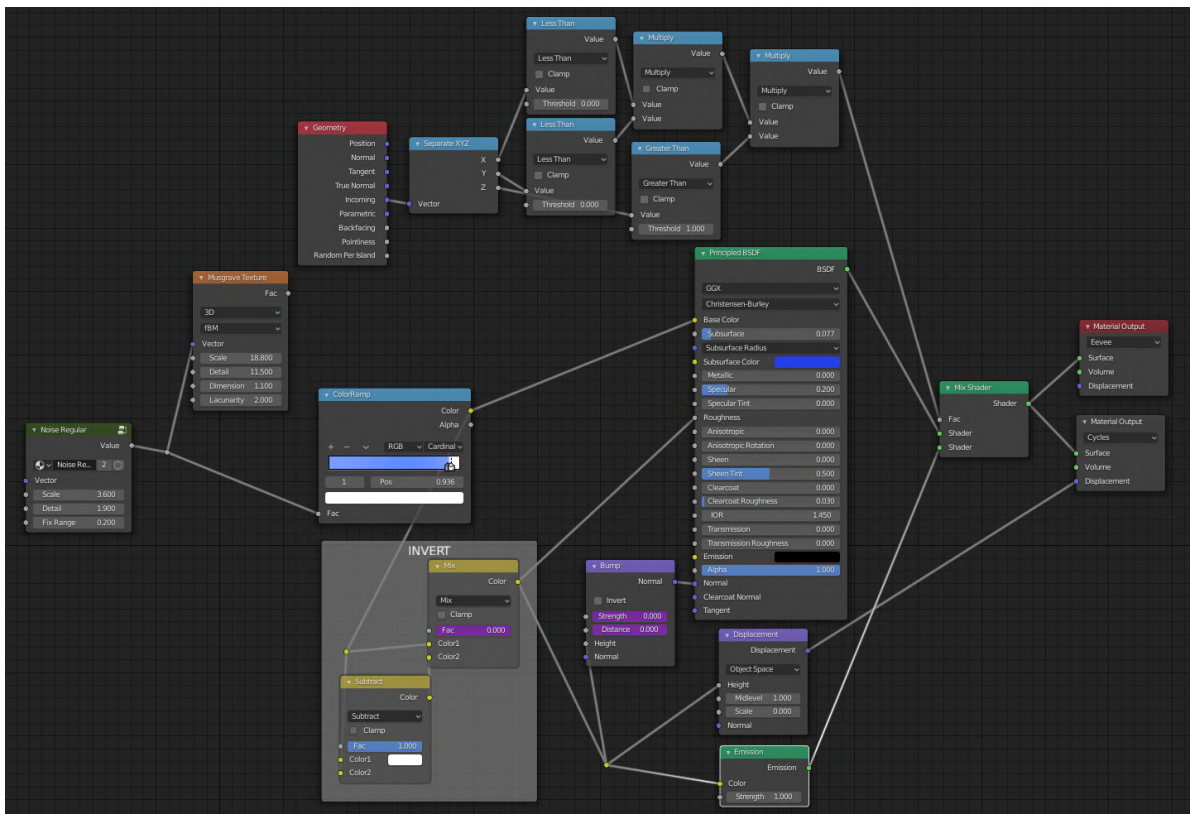

Figure 5.34: Portal Material

Figure 5.35: Nodes of Portal

Figure 5.36: Final Render of the Portal

5.3.3   The Materials of Marina Abramović

The material utilized for the crystals of Marina was one of the simplest ones. It is essentially a recreation of glass utilizing nodes. To create this all that was needed was a Glass BSDF (bidirectional scattering distribution function) node.
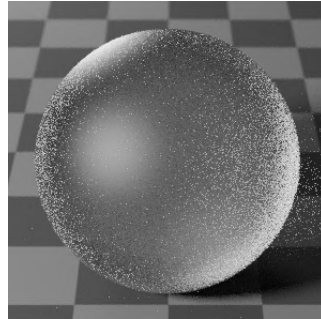
Figure 5.37: Crystal Material
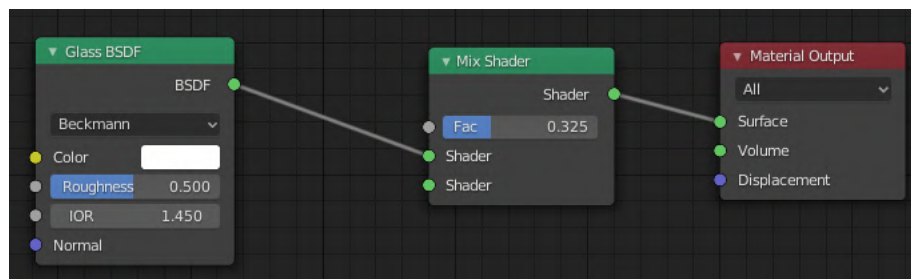
Figure 5.38: Nodes of the Crystal

The cave in which Marina's crystals are located is composed of only one material. This material also makes use of the Voronoi Texture node with the Euclidean distance metric. This combined with the Bump node creates the texture of the material while the ColorRamp controls the coloring.
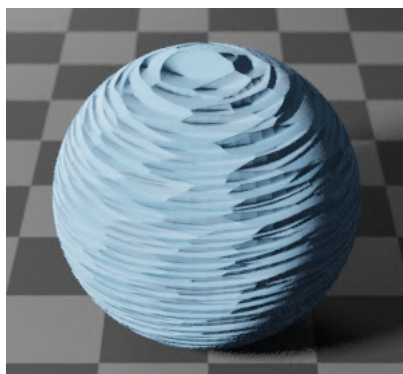
Figure 5.39: Cave Material
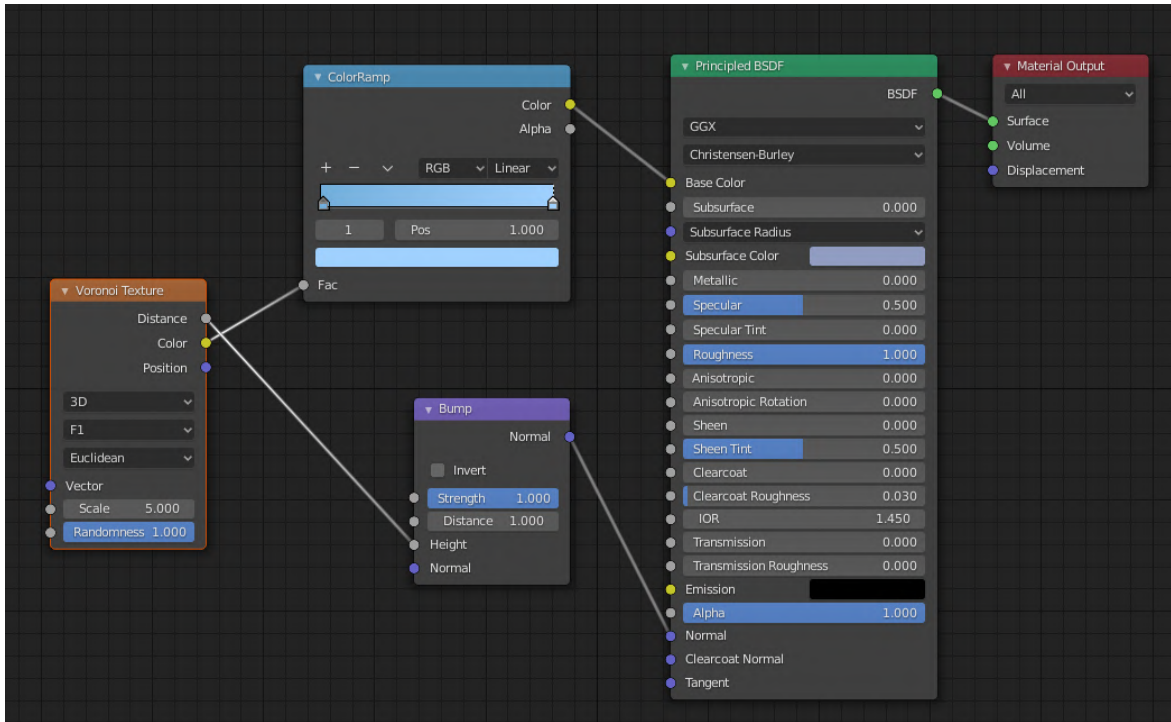
Figure 5.40: Nodes of the Cave
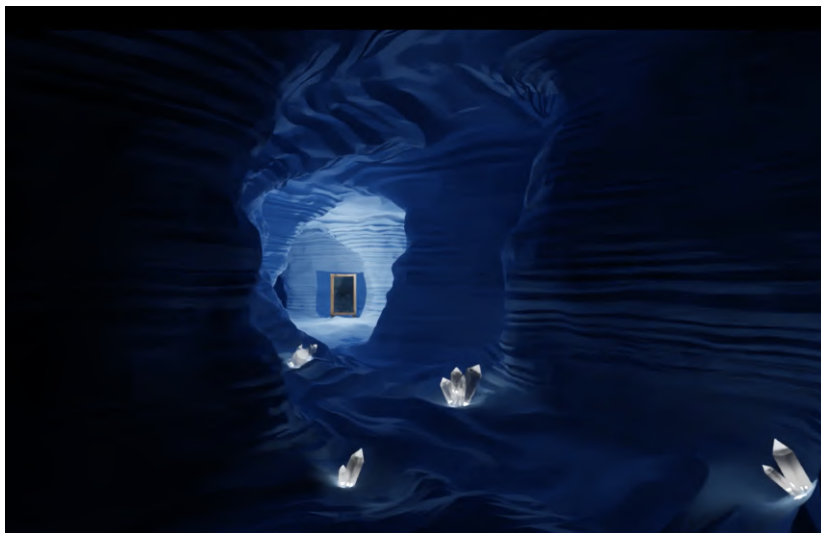
Figure 5.41: Final Render of the Cave and Crystals

5.3.4   The Materials of Berthe Morisot

For Berthe's mirror, only two materials were needed, both of them utilize the image node with the image of the painting I recreated but with different textures. The material for the wooden part consists of a Principled BDSF node with a medium roughness to keep the material from reflecting too much light.

Figure 5.42: Wood Paneling Material
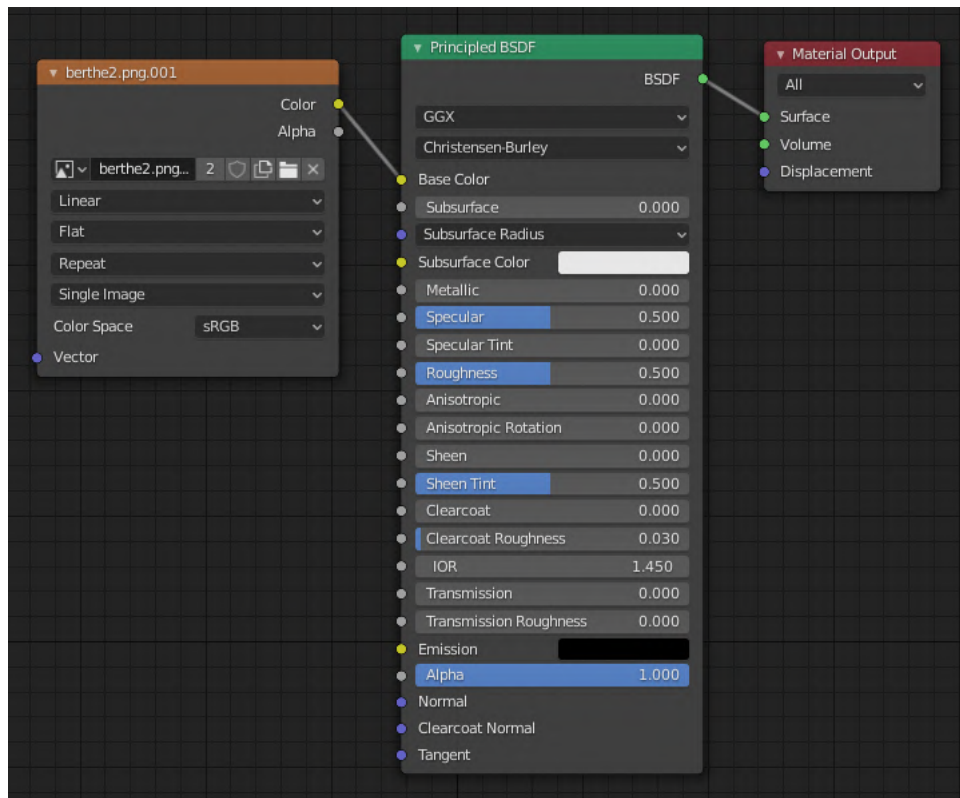
Figure 5.43: Nodes of the Wood Paneling

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The reflective plane of the mirror has a Glossy BDSF node with no roughness in order to reflect the inside of the cave.
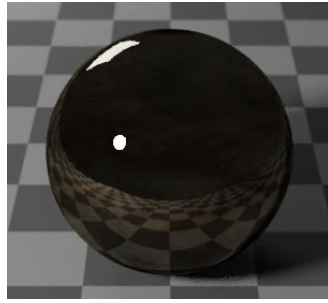
Figure 5.44: Mirror Material
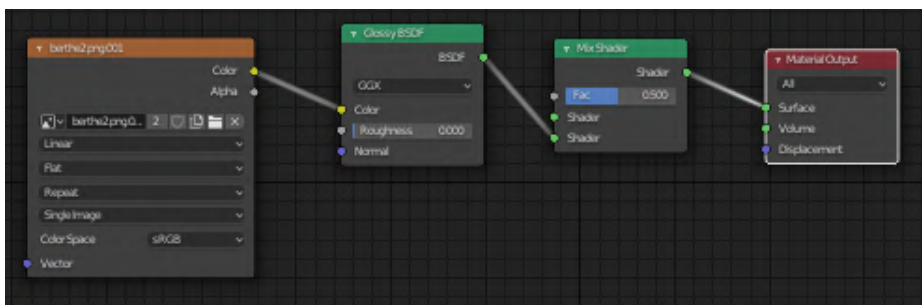
Figure 5.45: Nodes of the Mirror

Figure 5.46: Final Render of the Mirror

5.3.5 The Materials of Gunta Stölzl

Material for the weaving of Gunta was based on a pre-made material also made by Simon Thommes [66] and which was tweaked to show Gunta's pattern. This is one of the most complex materials, but the most important nodes are the Knittr node, which was created by Thommes, this controls the texture of the object while the Image node allows for the pattern to appear and finally the Magic Texture node along with the ColorRamp and Mix node control the positioning and color of the fuzz in the material.

Figure 5.47: Weaving Material
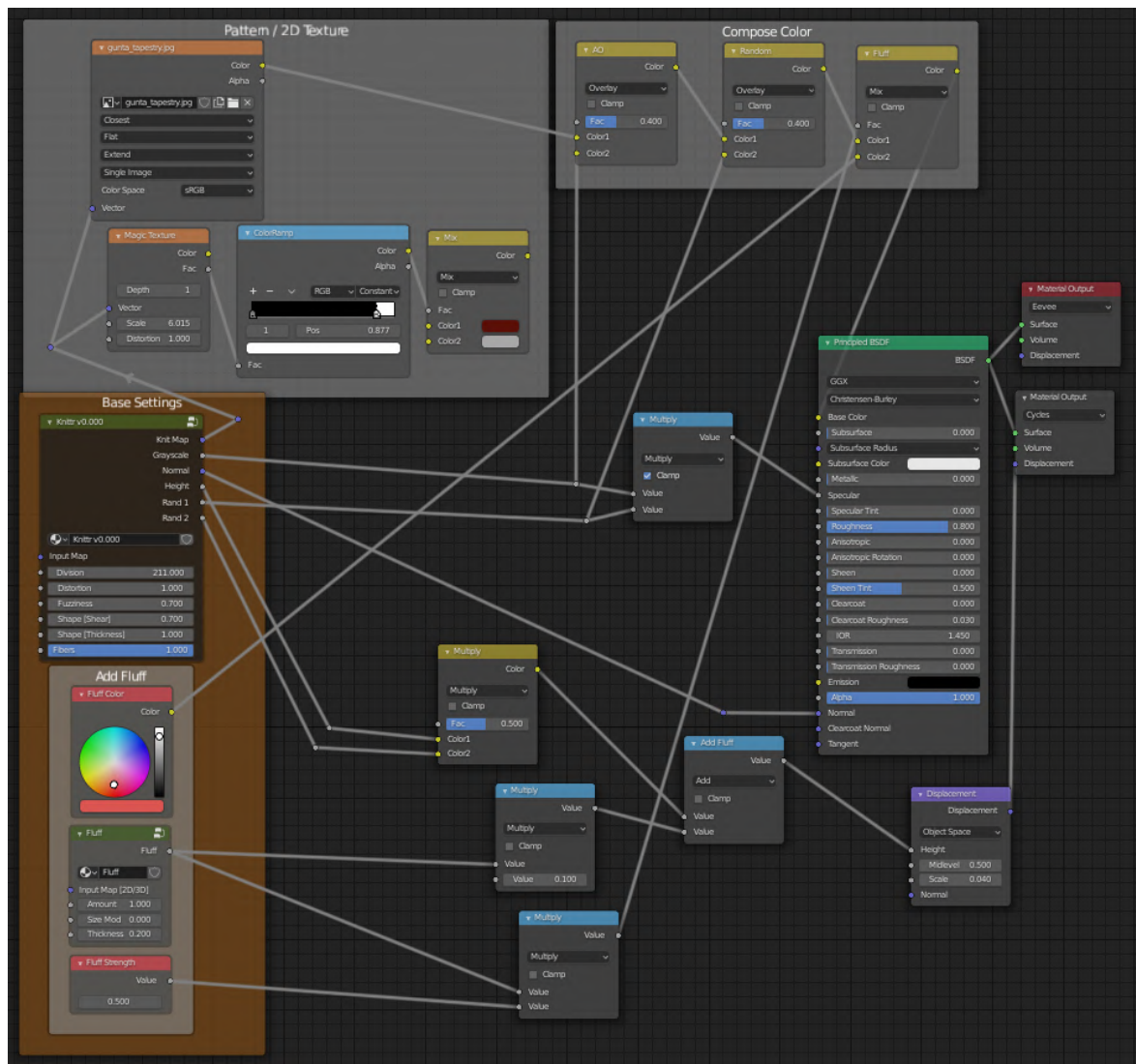
Figure 5.48: Nodes of the Weaving

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Figure 5.49: Final Render of the Weaving

5.3.6 The Materials of Qing Han

The recreation of Qing's work also only necessitated a single material. By making use of a digitally painted drawing, it was used in an image node, which alongside two colorRamp nodes which control the shine reflected on the material, and where this shine is positioned is determined by the Normal Map node.
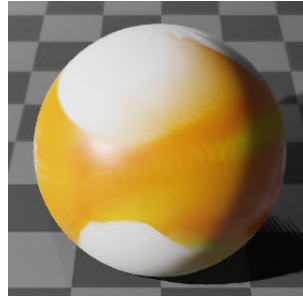
Figure 5.50: Fish Material
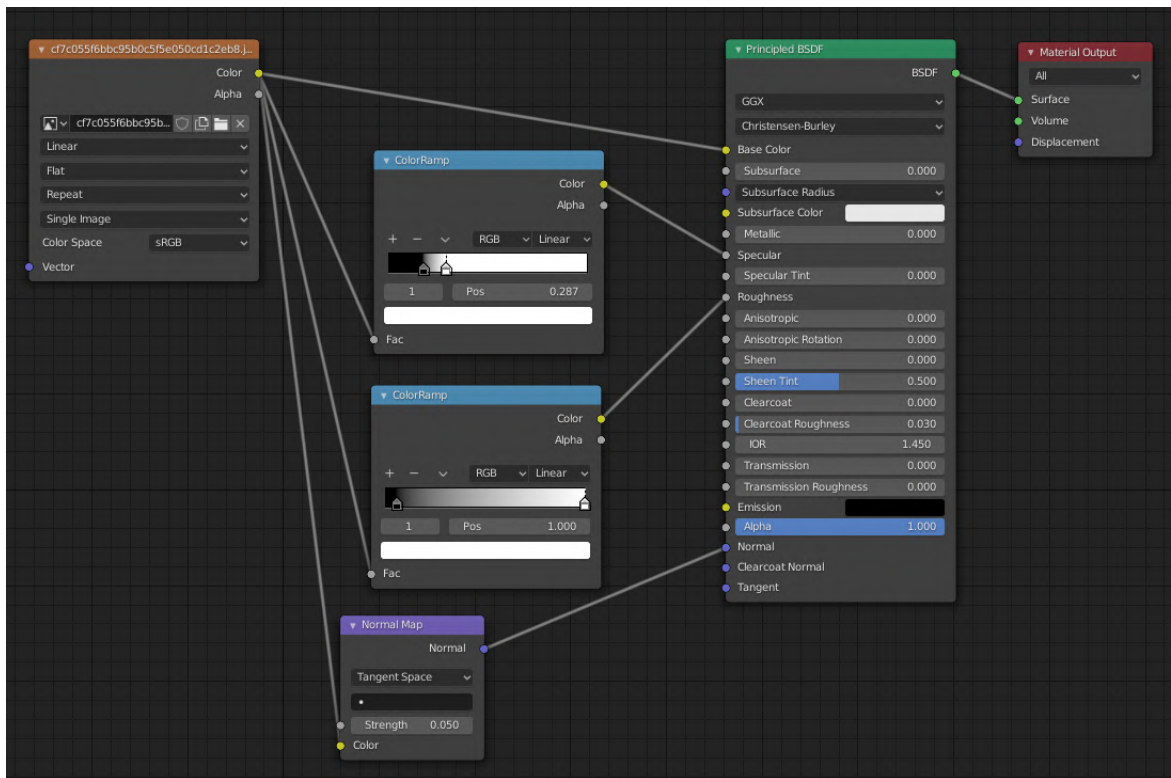
Figure 5.51: Nodes of the Fish

Figure 5.52: Final Render of the Fish

5.3.7 The Materials of Yayoi Kusama

Yayoi's recreated artwork was unique in the sense that the material was heavily dependent on the light that was positioned inside the 3D paper lantern. Therefore it had to be dark enough to dampen the light, but still translucent enough for the color to shine through and emulate paper. To accomplish this I made the Base Color black and then added a Translucent node with a red color.
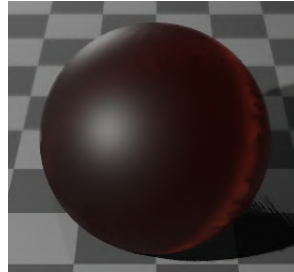
Figure 5.53: Lantern Material
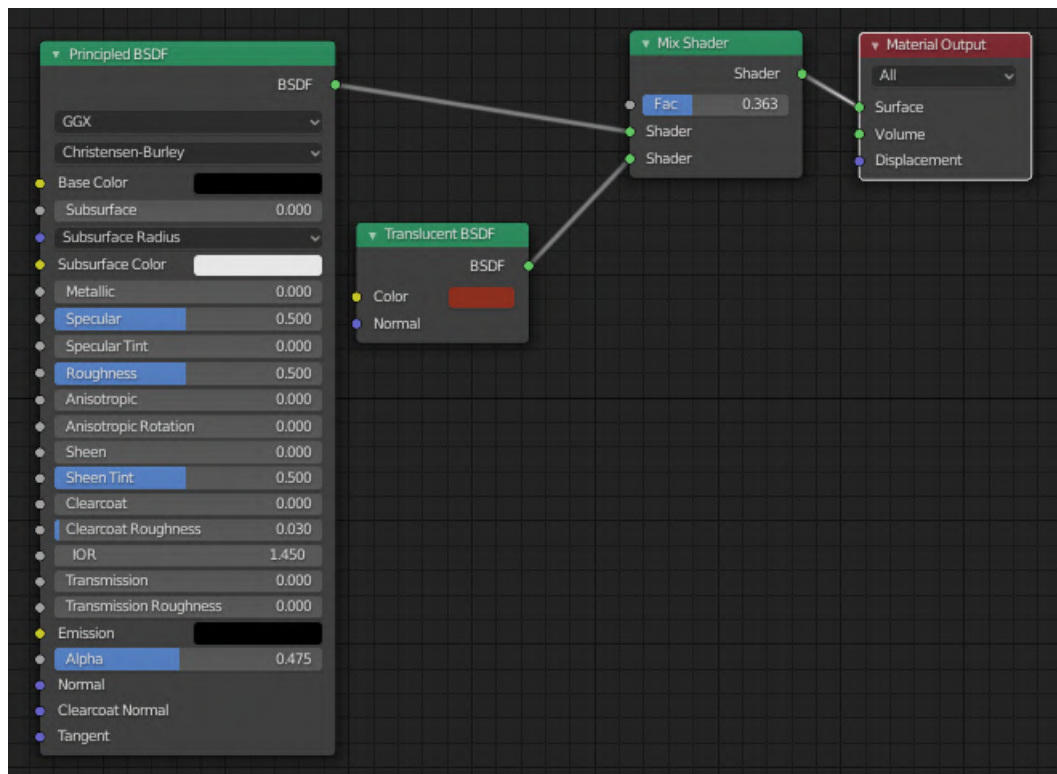
Figure 5.54: Nodes of the Lantern

Then as was previously mentioned, these lanterns were all placed inside 6 reflective walls, due to the limit of lights allowed in the program, to simulate the existence of countless lights. This material is similar to Berthe's mirror, but it does not have any image texture applied to it.

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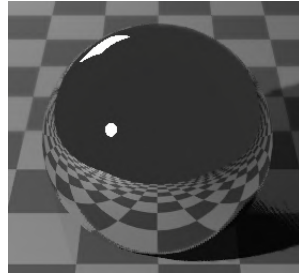
Figure 5.55: Mirror Material
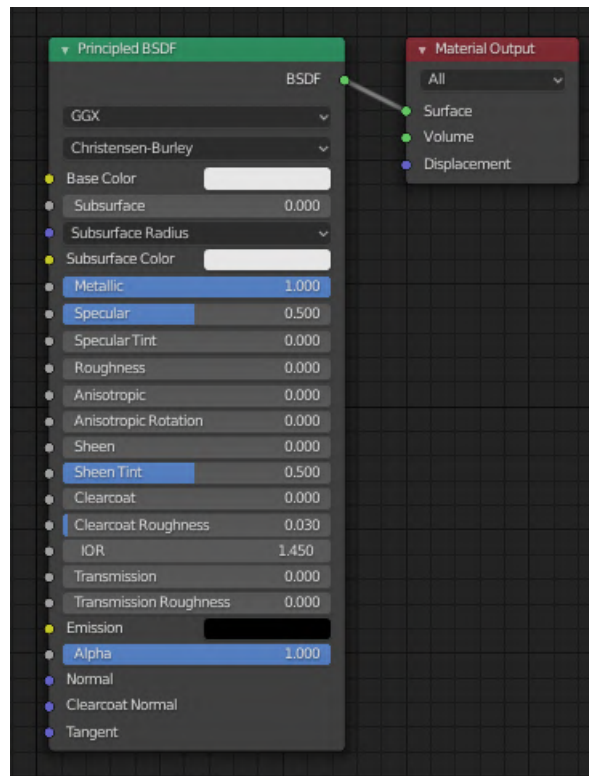
Figure 5.56: Nodes of the Mirror

Figure 5.57: Final Render of the Lights

5.4   3D UV Unwrapping

UV Unwrapping is one of the ways Blender allows users to apply images and textures onto objects. Essentially it "unwraps" the 3D mesh surface onto a 2D plane where it can be projected upon an image.

5.4.1   Texturing the Mirror of Berthe Morisot

In Bertha's painting we can see a mirror which contains the reflection of a young woman who is partially concealing it. So, some photo retouching was necessary in order to remove her from the image as well as reconstruct the part of the mirror which is covered. To accomplish this I utilized Adobe Photoshop and then carefully applied the image to all the sides of the 3D object, sometimes having to apply the same area of the image in order to cover the entire expanse of the 3D model.

Figure 5.58: *La Psyché* (1876)

Figure 5.59:   Texturing:*La Psyché* (1876) edited
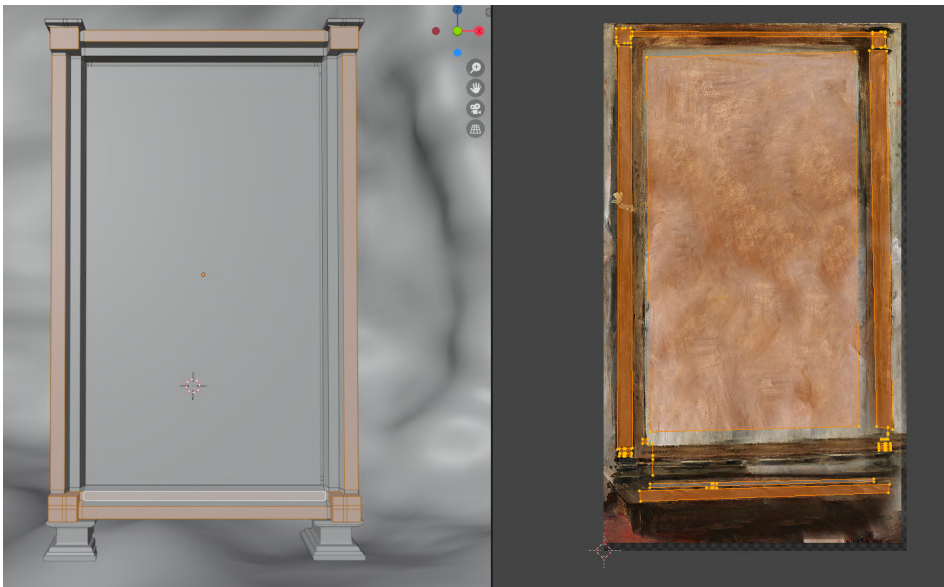
Figure 5.60

5.4.2   Texturing the Fishes by Qing Han

In Qing's case the process was quite different. While I still utilized Adobe Photoshop, my time was spent trying to emulate the style of Qing's illustration. To do this I painted a side profile of a fish and then applied it to the 3D model, also utilizing the UV Unwrapping technique.
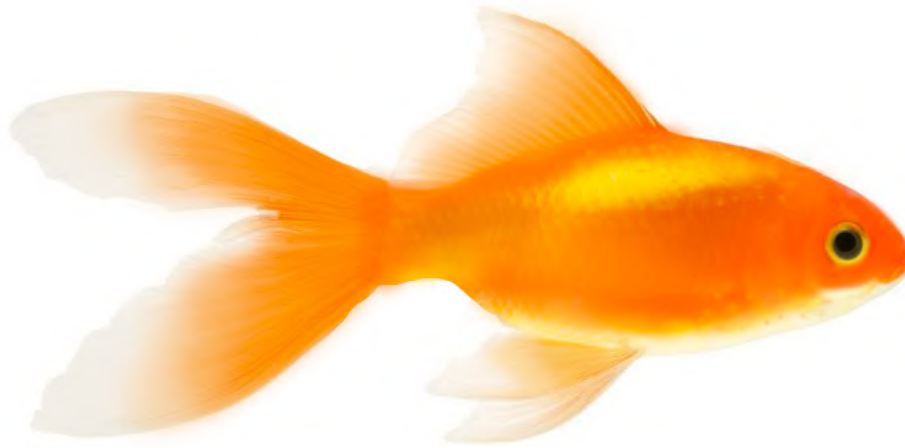
Figure 5.61: Texturing: Drawing of the Fish

5.5   3D Physics Simulations

Blender has a physics system which allows for the simulation of many real life occurrences, for example fluid, smoke, cloth. However, physics simulations can be very temperamental and just a small change in the parameters can result in a wildly different resulting animation. Trial and error only method to get the desired outcome. To create these animations I first had to bake them, meaning the program stores the cache for the simulation to then be rendered more efficiently. In the event of a change in any parameter, it required the bake to be deleted and then baked once again.

5.5.1   Gunta Stölzl

The weaving by Gunta had to be animated falling in such a way that the main character could be drawn upon it while seeming to be holding onto it. Meaning, there had to be weight on 2 of the corners of the object. This created several difficulties as the object itself was a bit thick, so when I applied cloth physics to it, it simply fell flat through the air. I first attempted to make two vertex groups with the intention of finding a way to increase the weight of the object, but only on the selected vertices. This attempt failed, so I proceeded to try to shape the object into the necessary U shape and simply let it fall as is, but this also resulted in very displeasing results. The final attempt consisted of carefully placing a wind simulation only upon the center of the object. Several other factors had to be tinkered with including the rigidity of the cloth simulation, the gravity, thickness of the air as well as weight of the object itself. This, finally displayed the intended result of the weaving falling so then it was time to animate it dropping on the floor. To accomplish this, a plane which was made invisible so as to not appear in the final render, was placed under

the falling weaving. Then I applied collision physics to both the floor and the weaving and it became a matter of once again tinkering with the details of the scene and rendering it multiple times until the desired footage was created.
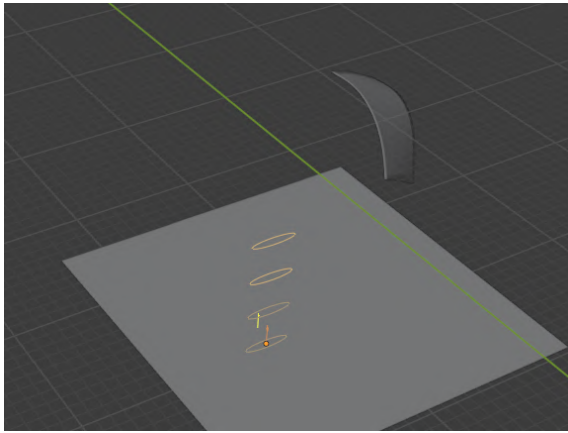
Figure 5.62: Physics Simulation: Wind simulation distorting the weaving
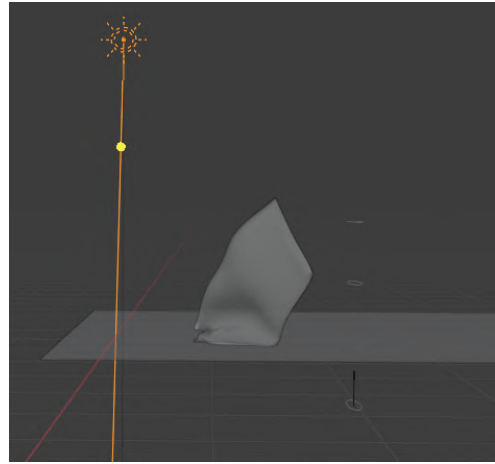
Figure 5.63: Physics Simulation: Weaving colliding with the plane
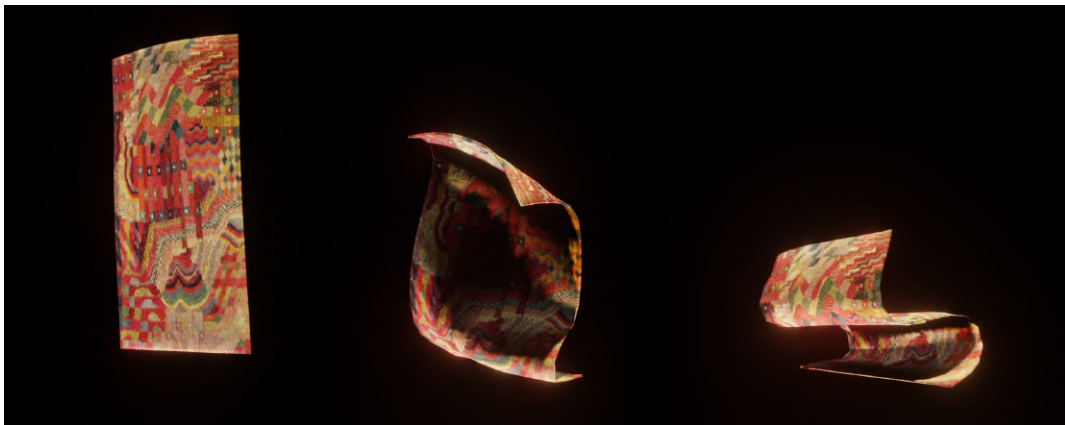
Figure 5.64: Physics Simulation: Examples of Failed Simulations

5.6 3D Animations

Animating in Blender can be achieved in a number of ways, whether it be by moving an object, deforming an object or inheriting an animation through another object. To animate, I had to use keyframing, a feature that marks the time in which a value of a property is changed. This animation is interpolated and has multiple methods such as Linear, Bézier, Quadratic, etc.

5.6.1 Animating the sea of Geng Xue

The main animation consists of the movement of the water which was achieved by keyframing the movement of the noise texture moving diagonally in the Node editor that was discussed previously. The other animation is in the movement of the camera, carefully coordinated in order to not shatter the illusion of a forest filled with trees.

5.6.2 Animating the Portal of Helena Almeida

The portal was bisected and each section was keyframed to move separately and with special attention to the Bezier curves of the keyframes to make the movement seem more natural.

5.6.3 Animating the Fish of Qing Han

Qing's fish were animated in a procedural way, meaning that rather than create an armature for the fish and then keyframing all of it's movements and then repeating this process for every single fish, instead I chose to apply two noise modifiers to the fish, one bigger than the other, but only on the Z axis which is the direction I wanted to fish to swim in. These noise modifiers in the correct axis, cause the distortion of the fish in such a way that replicates the undulating movement of real fish in the water. I then parented all the fish to the main one so they followed it's movements.
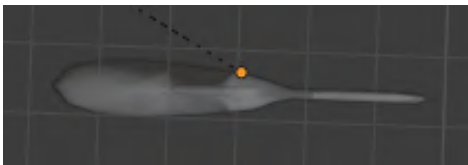
Figure 5.65: Animating: Fish with no modifiers
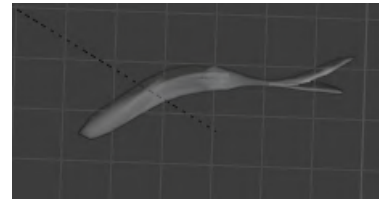
Figure 5.66: Animating: Fish with modifier

5.6.4 Animating the Lights of Yayoi Kusama

Yaoi's lights were keyframed by groups, and some individually. They presented a challenge given that each lamp had a light source inside it and at times the light would not be keyframed properly to follow resulting in a lengthy animation process, moving and keyframing a hundred lamps. It also required some careful and detailed camera work, as the reflections of the light's were temperamental and would sometimes only reflect the light and not the lamp.
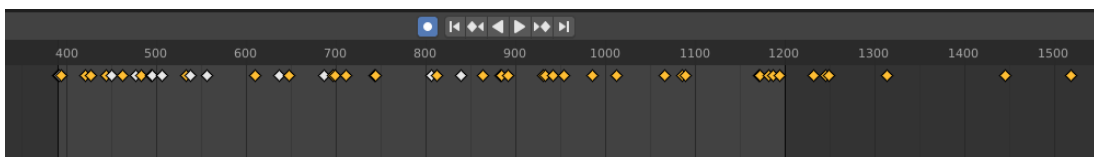
Figure 5.67: Animation: Keyframes of all the Lights

5.7   2D Animations

In this section I will explain the choices behind the animations of the main character, as well as the programs and methods used.

5.7.1   Animation using After Effects

As it was discussed, the original plan was to animate everything utilizing Adobe After Effects along with the third party add-on DUIK. However, I soon realized this plan would be impossible due to how complex the movements would be to traverse the 3D backgrounds. These movements are not supported by DUIK, which limits the way a character can move. Beyond that, it was also quite inefficient time wise, due to the fact that every single illustration had to be broken down and separated into different layers and then these layers had to be organized and carefully placed within After Effects. In the end, only two scenes were done utilizing DUIK and both required hours of work in order to be animated correctly.
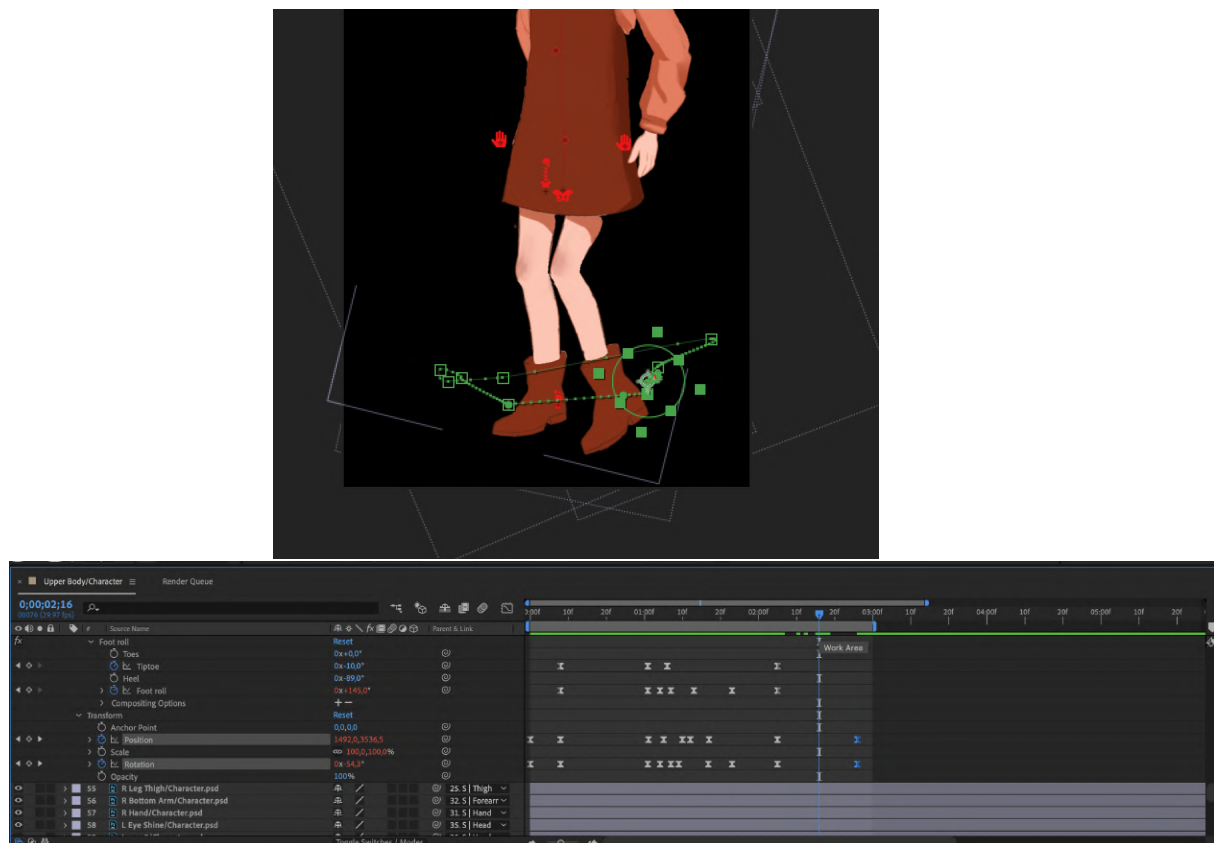
Figure 5.68: After Effects: Visualizing All Keyframes

5.7.2 Animation using Procreate

It became clear that I would require an alternative way to animate the character so I began looking into alternative softwares. But due to the reasons mentioned in the next chapter, none of these were able to be utilized. As a last resort I was forced to use the application Procreate and its' primitive animation feature to animate the character. So a more traditional approach had to be taken and frame by frame animation became the new plan.
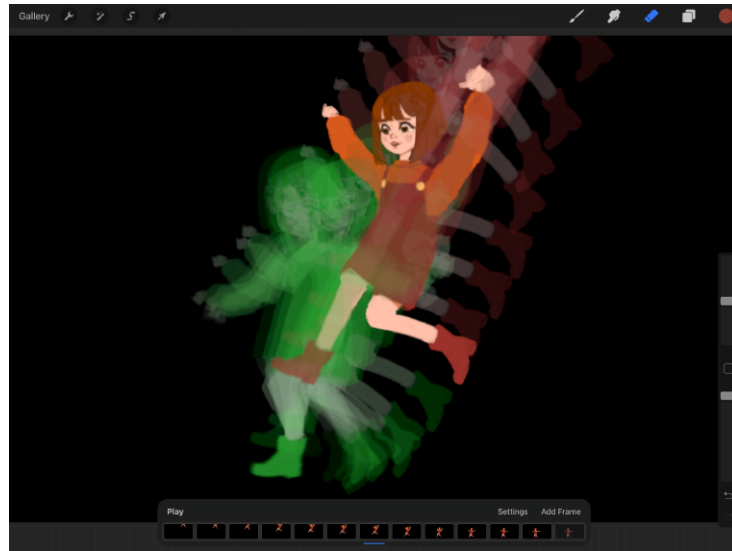
Figure 5.69: Procreate: Visualizing All Frames

A reference model was asked to act out all the movements of the main character, these movements were filmed and then consequently studied and referenced in the animation process.
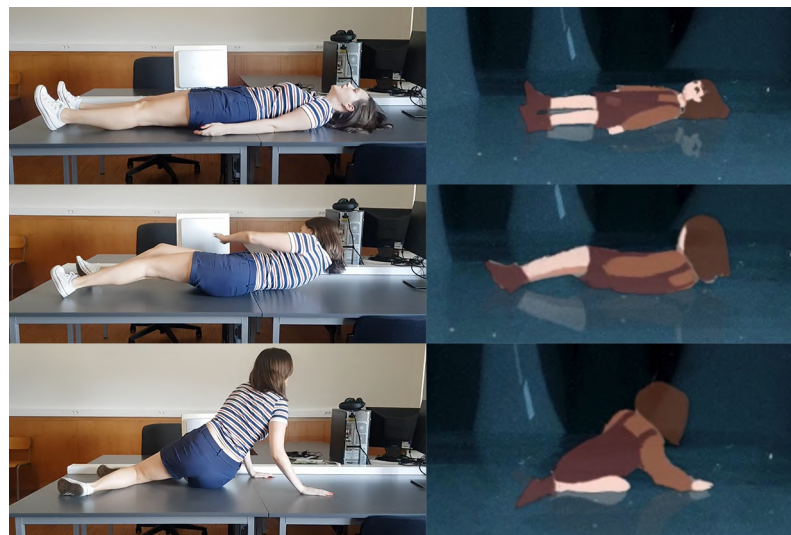
Figure 5.70: Procreate: Referencing Images

Due to all these new constraints and challenges, I decided to further simplify the art style of the main character, and as such, all outlines were removed and only blocks of color were used in terms of character design.

5.8   Conclusion

This phase in the project was the longest and most arduous, partly due to the changes in source material, but mostly due to the fact that I was learning to use these technologies and techniques as I created the film.

While utilizing Blender there were a number of rendering issues that occurred, ranging from the program crashing mid render, to the fact that most scenes required multiple renders due to problems that were not visible during the preview in the software. So for every 5 second scene, there was at least several minutes of footage that was deemed unsatisfactory. There was also an issue with extremely long render times for several of the clips in the film. This meant the 3D portion of the project took far longer than I could have anticipated.

In regards to After Effects, as previously mentioned it was meant to be the only 2D animation program used alongside the DUIK ad-on. Unfortunately, this was made impossible due to the intricate movements required of the main character. So several softwares were researched such as ToonBoom Harmony and Adobe Animate. All of which have many features I needed, such as being able to view the moving background and animate over it. Or being able to clearly see the previous frame in order to recreate it and being able to export the animation as a video file with no background to then place it over the background footage. Unfortunately, both of these required a computer drawing tablet and having one in my possession I was certain I would be able to test and then choose the best software for the film. However, when it came time to begin the testing, I discovered that the equipment I owned was damaged, which made its' usage impossible for the project. As mentioned previously I found that the only real alternative at my disposal was the Procreate application and its' rudimentary and basic animation features. Ideally, testing should have occurred far sooner, but due to lack of experience with all of the used software, there was no accurate way to predict the amount of time necessary to become comfortable with the tools used. Regardless, all of the 2D animations were completed even if with less detail than originally planned.

Chapter 6

Post-Production of the Film

6.1 Introduction

The line between production and post-production of the film was a blurry one. This is because the editing process of the animations was often the best way to realize when it was necessary to go back and make changes to the contents of the film. However, in this section I will discuss the final and decisive touches made to the film.

6.2 Editing

In Adobe After Effects, I organized and placed all the rendered clips in the correct order. This showed me that there were some continuity problems with the footage I had rendered. So in this phase there had to be a lot of back and forth in order to ensure that there was continuity in the film. This caused me to have to continuously edit in new clips to ensure that the clips flowed naturally.

6.3 Compositing

Compositing was done in both Blender and in After Effects. In Blender it was done with nodes in order to color correct, denoise and add glow to the rendered animation through the Denoise and Glare nodes.
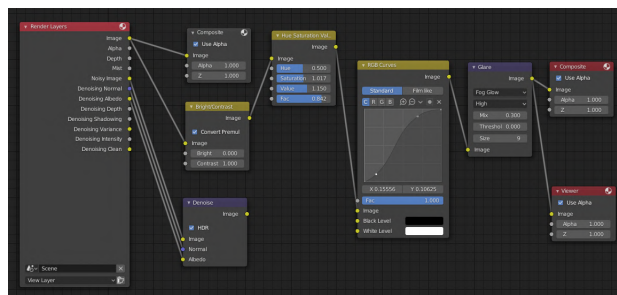
Figure 6.1: Compositing: Forest

In Adobe After Effects, the same was done but with the color curve effect. But most of the compositing was spent on the the arduous task of including the 2D animations and
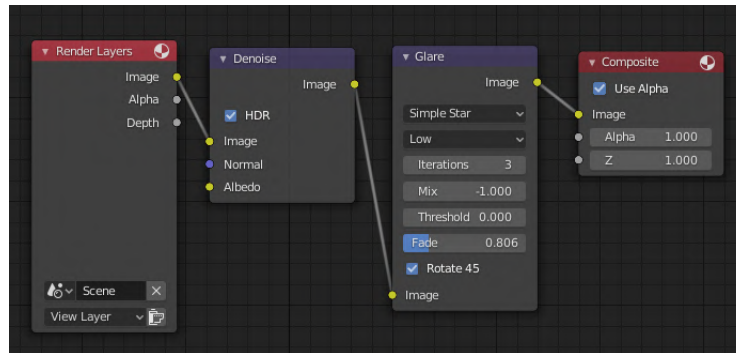
Figure 6.2: Compositing: Cave and Crystals

removing their background by using the Shift Channels Effect. This process caused the footage to lose it's opacity, so for every animation clip, four to six layers were needed, all of them eventually having to receive some degree of color correcting. This resulted in having to repeatedly apply effects to every layer and assure that no layer was out of place unsynchronised with the rest
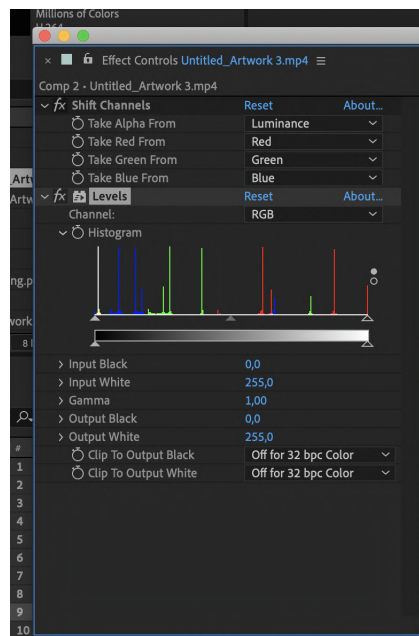
Figure 6.3: Compositing: Color Correcting

Some of the animations had to be hand tracked onto the moving background, as well as motion tracked, which proved to be very time consuming.

Furthermore, masks were utilized in order to cover the sections of the character which needed to be "behind" some of the 3D footage.

Figure 6.4: Compositing: Motion Tracking

6.4   Effects

In After Effects a ray of light was used in the museum scene. Gaussian blur was used in the mirror and crystal scene in order to convey depth. Masks had to be used in several instances to hide the character when she was supposedly behind a 3D object, such as in the cave scene.
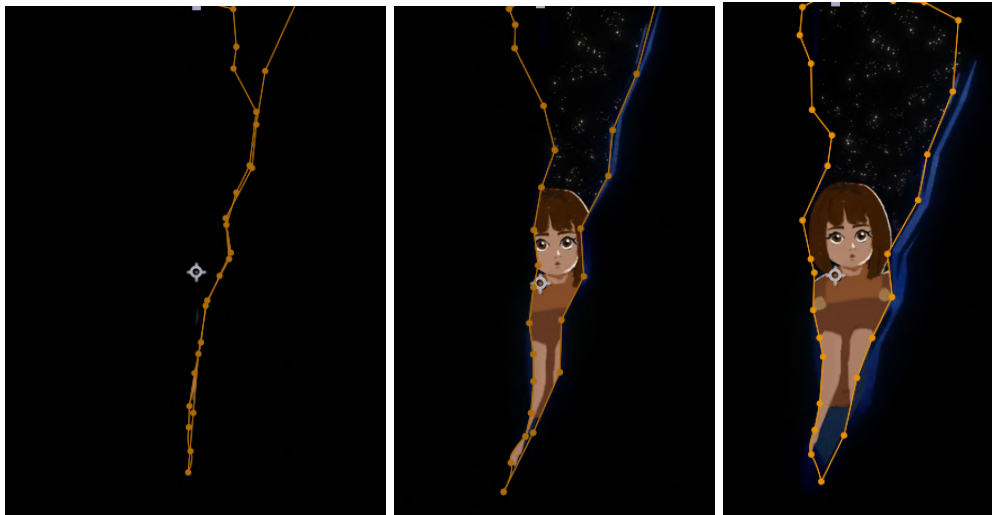
Figure 6.5: Compositing: Masks Moving

In order to remove the background from the 2D animation alpha channels had to be utilized as well as the reflection of the character on the porcelain floor. The also required a wipe to make it appear like a natural reflection.

6.5   Title and Credits

For the title screen and credits, stock footage of ink dropping in water [67] was used in order too mask the layers containing the footage of the artwork while the face of the artists show on the side. Alongside these footage, I also used the Google font "Yeseva One" designed by Jovanny Lemonad [68] for the title and credit information.

Figure 6.6: Title

This same stock footage was used in order too mask the layers containing the footage of the artwork while the face of the artists show on the side.

Figure 6.7: Credits: Original Ink Footage
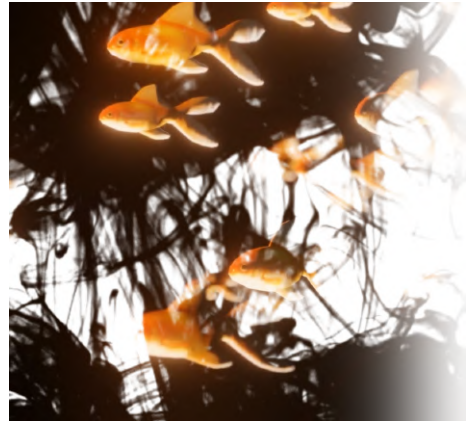
Figure 6.8: Credits: Ink Footage Edited

All the artists were drawn in the Procreate application in order for the viewer to associate a face to the name and artwork presented.

Figure 6.9: Portrait: Geng Xue

Figure 6.10: Portrait: Helena Almeida

Figure 6.11: Portrait: Marina Abramović

Figure 6.12: Portrait: Berthe Morisot

Figure 6.13: Portrait: Gunta Stölzl

Figure 6.14: Portrait: Yayoi Kusama

6.6   Sound

The background music in the film was created by José Afonso Baptista Vieira utilizing the software Ableton Live Suite 10. The tone of the song was created keeping the Lo-fi music genre in mind and as it was specifically created to accompany the video, each beat matches a significant moment in the film. Because of this further atmospheric background sounds were not added as they clashed with the music.

6.7   Promotional Material

For promotional material I created a series of posters that could be shared online.
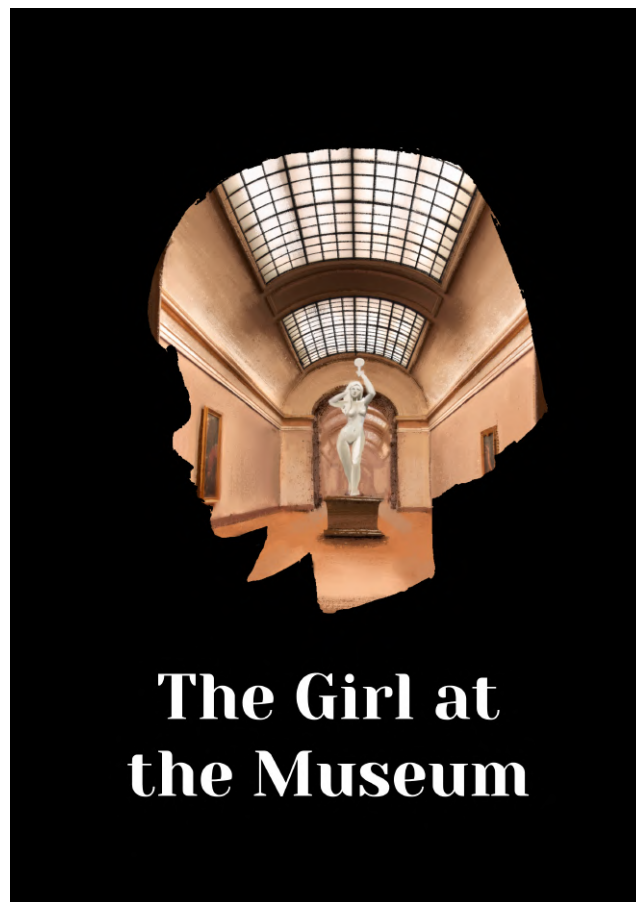
Figure 6.15: Promotional Material

Figure 6.16: Promotional Material
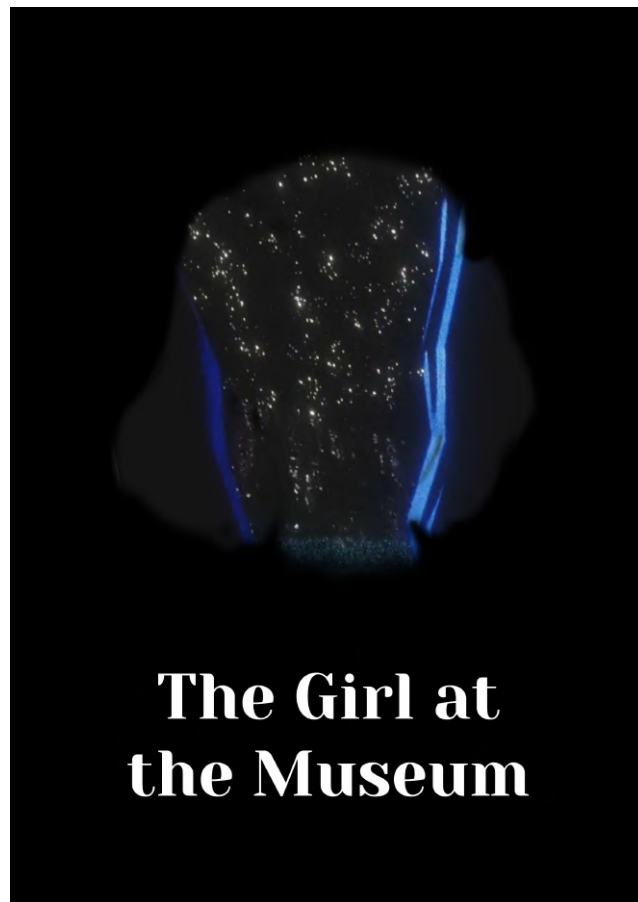
Figure 6.17: Promotional Material
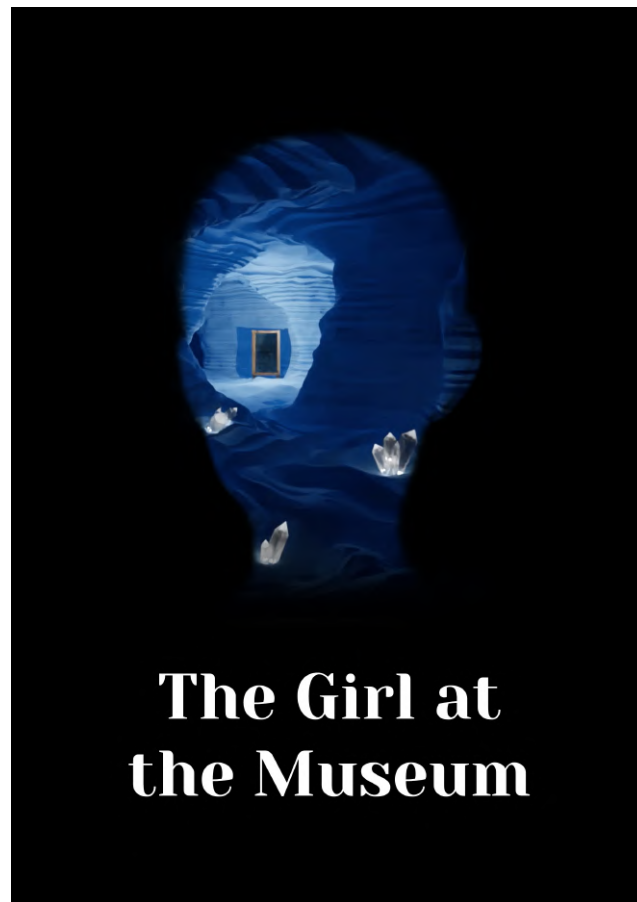
Figure 6.18: Promotional Material

Figure 6.19: Promotional Material
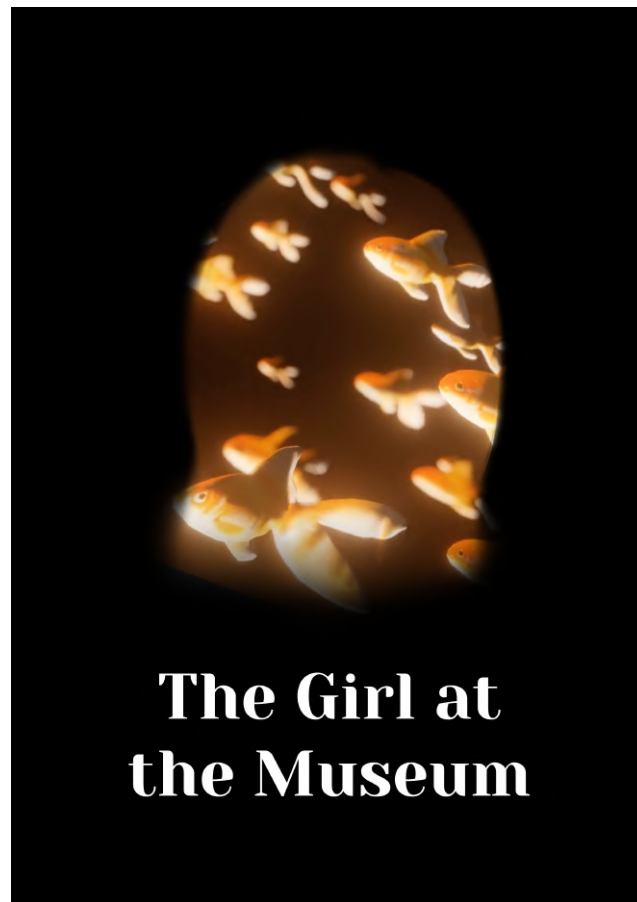
Figure 6.20: Promotional Material
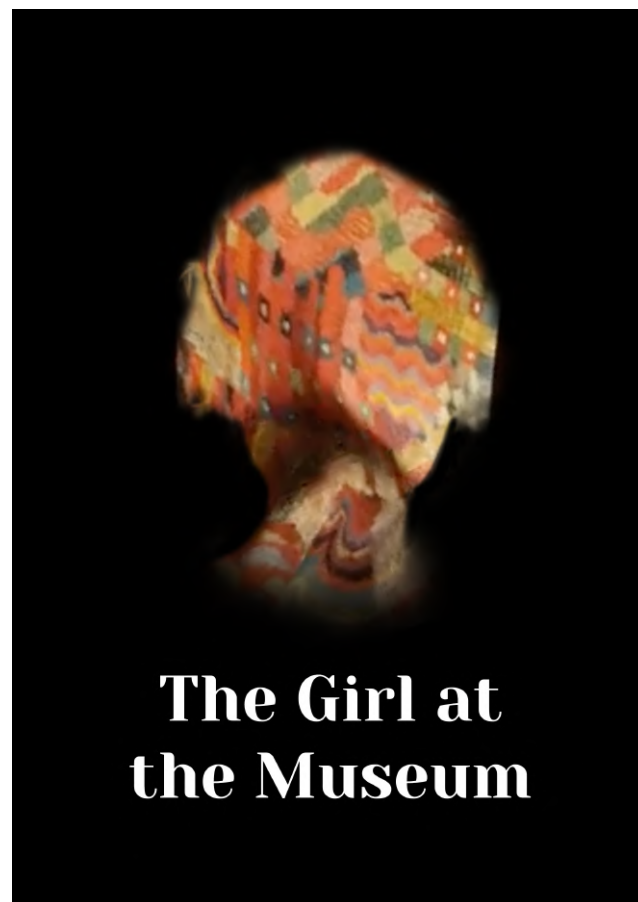
Figure 6.21: Promotional Material
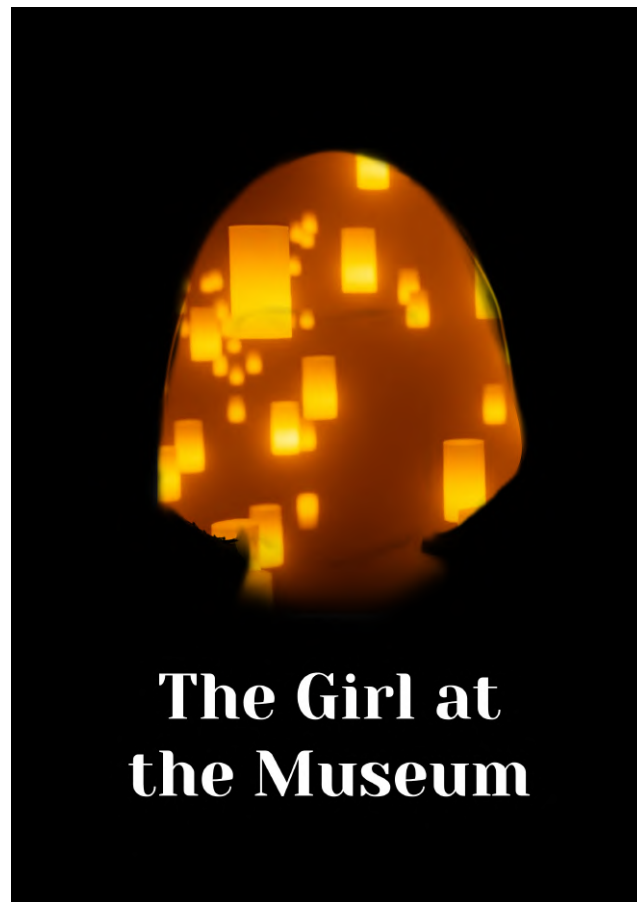
Figure 6.22: Promotional Material

6.8   Conclusion

This particular phase of the project proved itself to be particularly challenging due to the 2D animation having an irremovable background. It meant my main focus was no longer to simply edit the clips together, but also to go to great lengths to make the character blend in with the 3D background. Because this task required a lot of attention to detail, sometimes even having to go so far as keyframing every other frame, it meant that other parts of this phase didn't receive the amount of time they should have. It was due to these time constraints that I was unable to create more promotional material.

Chapter 7

Conclusion

My work showcases art from seven inspiring artists who are not well known to the general public. I started this project with the goal of bringing less known female artists to the forefront. And I tried to achieve this goal by showcasing art from seven inspiring artists who are not well known to the general public through the medium of a small film.

This was a process of great personal growth. I learned to created complex 3D environments which contained hundreds of objects, with complex meshes and materials. And with this knowledge I created a film with fully illustrated backgrounds, digital, procedural and frame by frame animation.

But it was also a period of hardship in which I faced many setbacks and had to push through by engaging in resourceful problem solving. Behind every second of this film there is hours of dead end research, failed experiments, and unused footage. But after all these months I am proud of what I have achieved and was able to present.

My hope is that my short film can inspire girls to see themselves as creators of art rather than an object of it. That they will feel empowered to create something that represents them and their voice.

The film can be viewed in the following link: `https://vimeo.com/473860659`

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