The Final Major Project

Element 1

Shiyu Wang (19026103)

CONTENT

Summer project

IDEA 1

My first idea was about the life-threatening threat that marine litter poses to marine life. Especially the hard-to-biodegrade plastics, from tiny particles to our daily necessities, which invade the habitats of marine life in a pervasive way. The hermit crab in the picture on the right mistook the toy head for a conch, giving it the Uncanny Valley feel and reminding me of Baby Spider from Toy Story(1995). This grafting of different body parts is a good inspiration for character design, so I did a little testing in Maya.

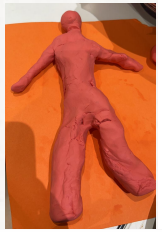
Maya modelling tests

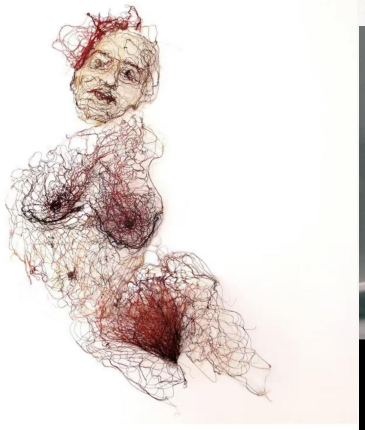
Summer project

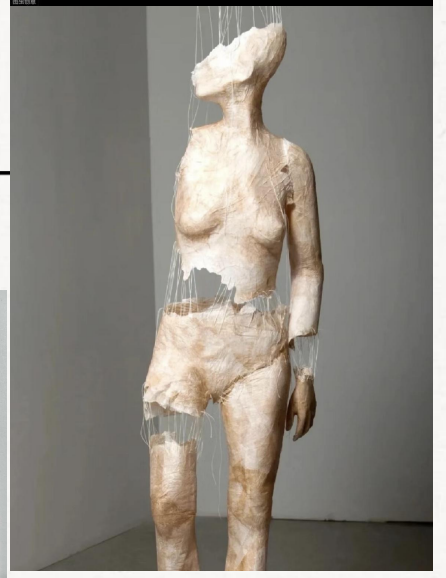
IDEA 2

My second idea comes from the novel *The Man in a Case(Chekhov, 1898)*, which expresses man's stubbornness and unwillingness to breaking down the barrier, confined to his own thoughts and never changed. It also shows how people are sometimes reluctant to step out of their comfort zone and isolate themselves from the rest of the world.

After discussing with Jane the idea that I wanted to model the human body and then put a barrier on the outside of the body and let the body dance or struggle, to reflect the confinement of the mind by external or internal factors, and the powerlessness of wanting to escape but not being able to do so, Jane suggested that I should first have a better understanding of the human body, and so I did some sketches and clay sculptures.

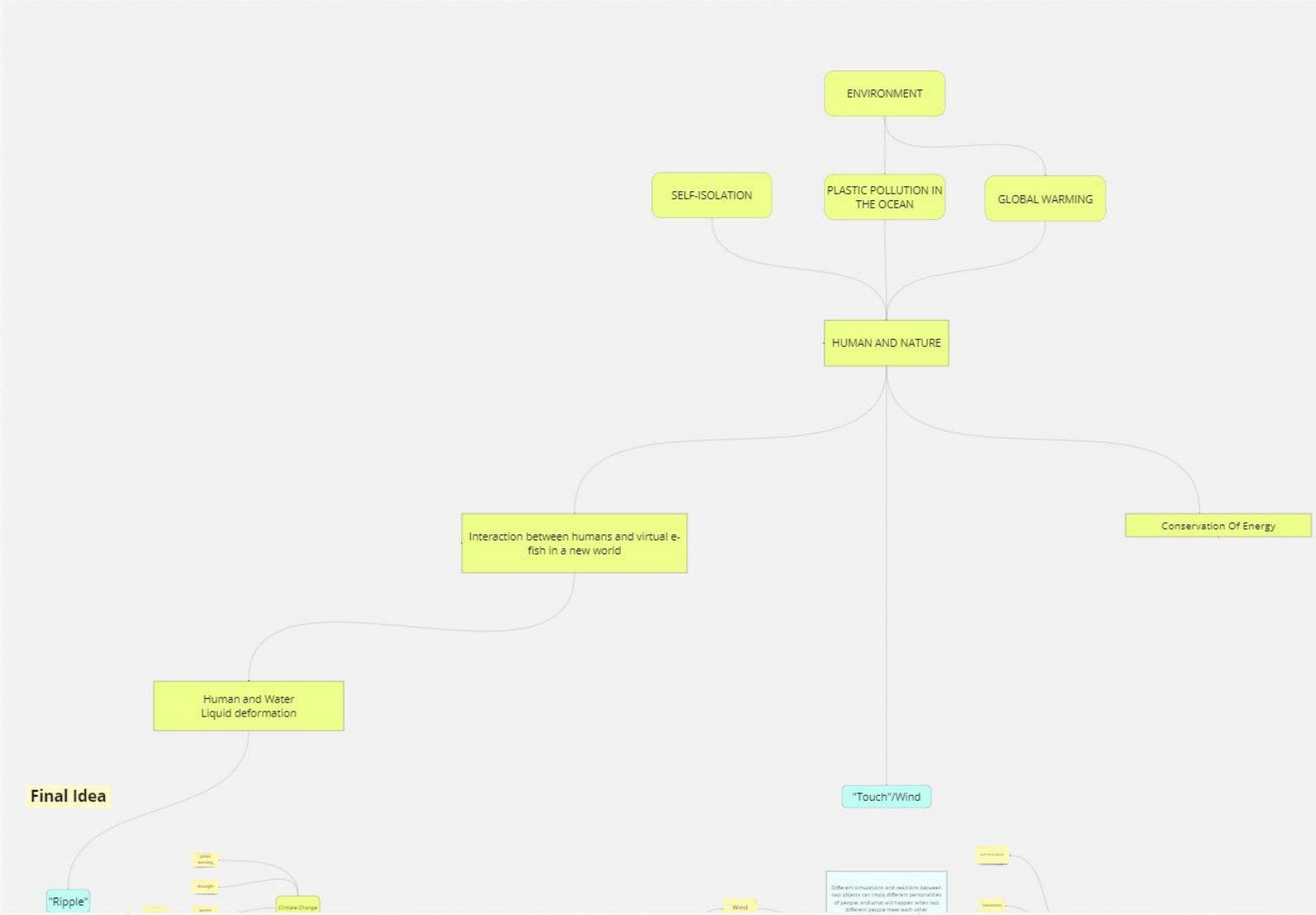






FMP

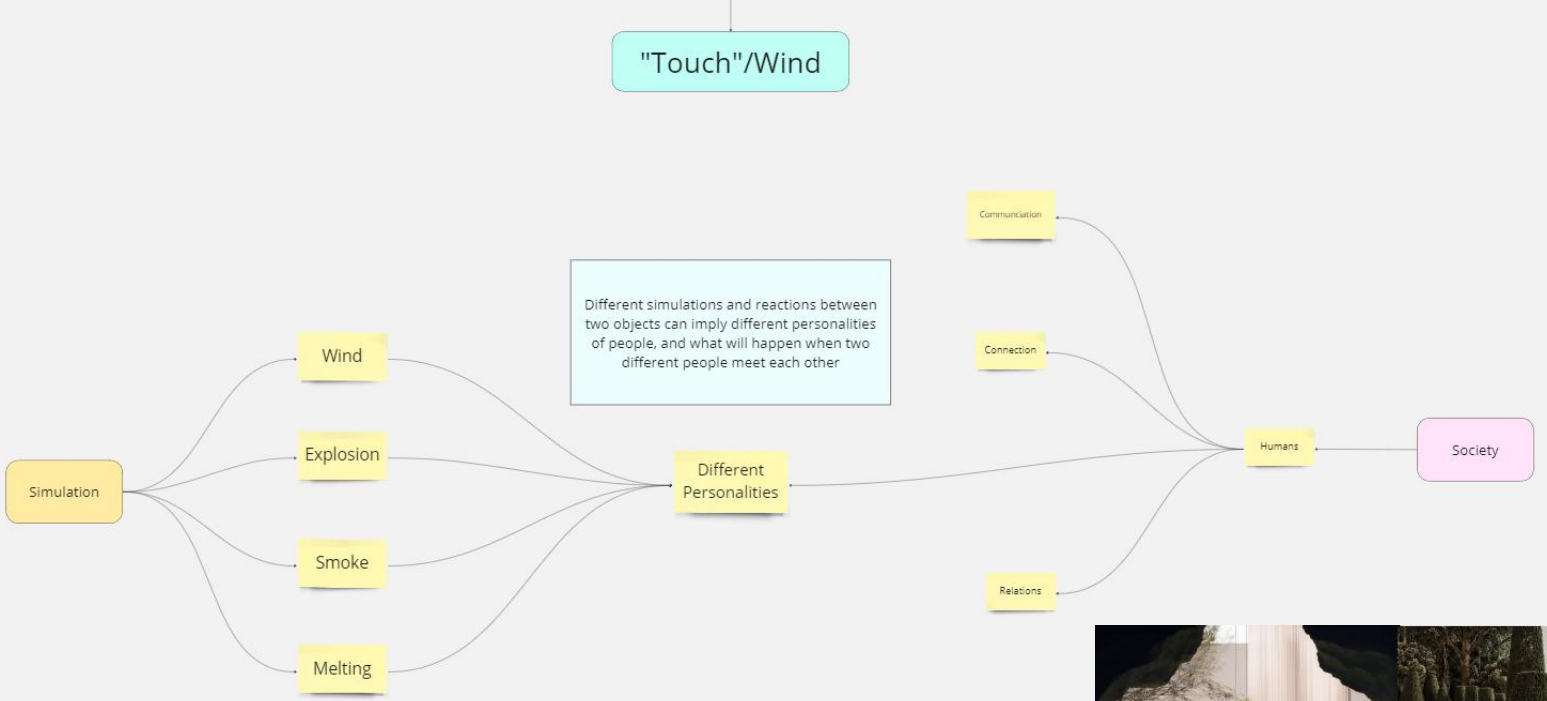
PRIMARY RESEARCH



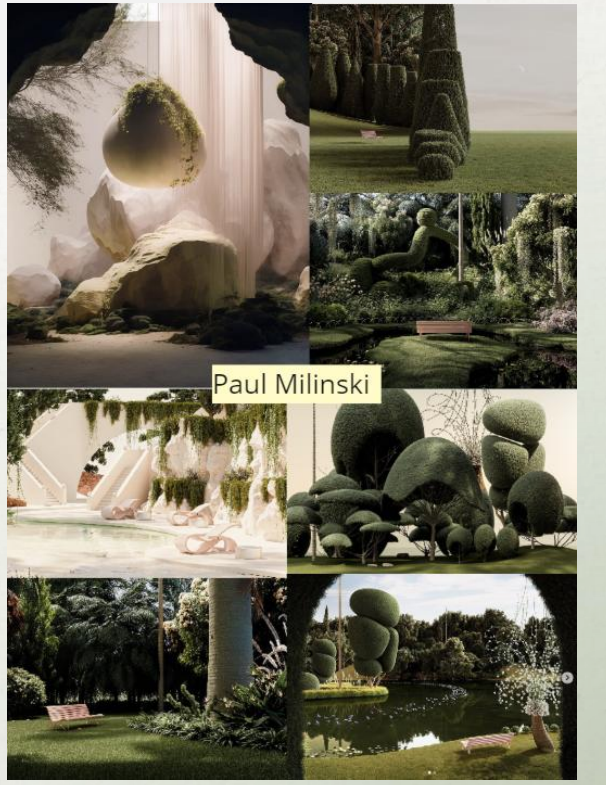
In order to identify shared interests in various themes, we made mind maps to find the same interests in multiple themes, techniques, and visual effects. I discovered ‘ocean plastic pollution’ and ‘isolation’ as her ideas. And Michelle’s idea is about liquid morphing, global warming, and memory storage. We selected similar elements like environmental issues and humans as the starting point. In the beginning, we wanted to tell a story about a lonely human and an electronic creature in the period when all creatures were extinct on the planet. Furthermore, the electronic creature was a fish that lives inside a fish tank. However, we thought demonstrating the species extinction background was complicated. Thus, we improved the idea to a simpler narrative containing information about breaking the isolation, a person, creatures, and liquids.

FMP ITERATION

We also had an extended idea about a balloon travelling, alone it flew to a park to have a one to one reaction with a bunch of balloons, all of them exploded or melted only one balloon matched it and flew away. After sharing the idea with tutors Klaus, Sam, and Jane, Michelle and I agreed that doing human-water interactions had more 3D animation possibilities, so we wanted to challenge ourselves.



Indeed, "Ripple" is the topic we finally selected. This word comes from the liquid visual effect we want to make, and it's a word that can be explained in multiple ways. For instance, a ripple could be a small change or action which causes a significant effect. We wanted to use the "ripple" to relate to environments or places in order to establish the connection with summer research. Furthermore, a ripple could be explained in a psychological way, like something changed in our deep hearts. The ripple can be demonstrated through 3D simulations as well.



SECONDARY RESEARCH

FMP MOODBOARD

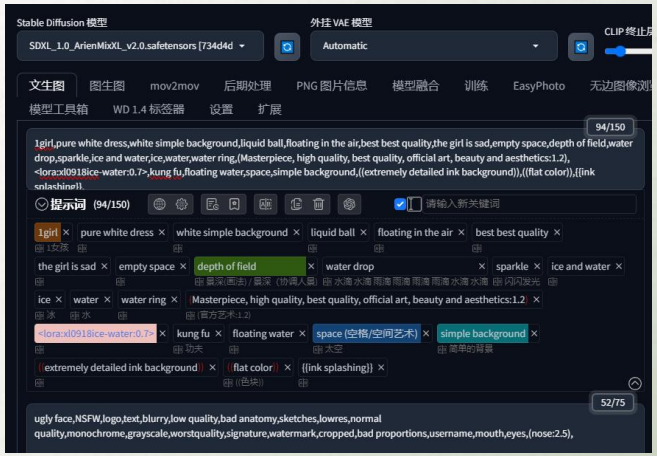
"Ripple", a small action can cause a big change, which also represents the psychological change

"Ripple"
After clarifying the theme, we looked at some artists' works to observe their visuals, modelling and simulation of the 'liquid' element, to find some ways we could use it ourselves. Character design and camera angles were also inspired by these. The overall mood is water, human insignificance, and otherworldliness. The otherworldly world is represented by our scene setting of empty white space and a naked Cyberman-like character.

FMP

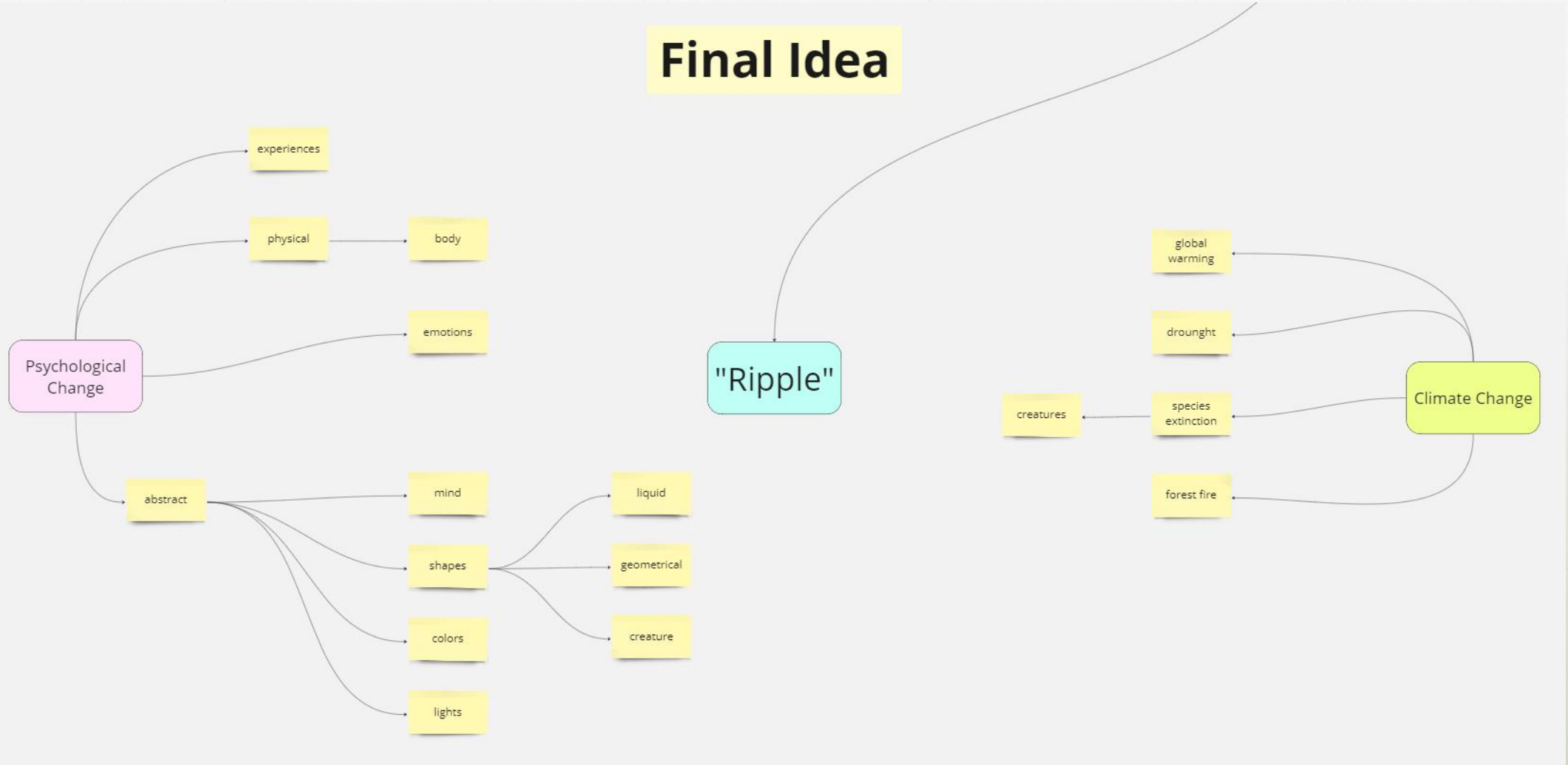
AI-GENERATION TESTS

I did some AI generator tests, and hope it will give us some inspirations. There's very little that ai can bring to the table without having fully mastered Stable Fiffusion, but it's a pleasure to try different and bring some fun and inspiration.

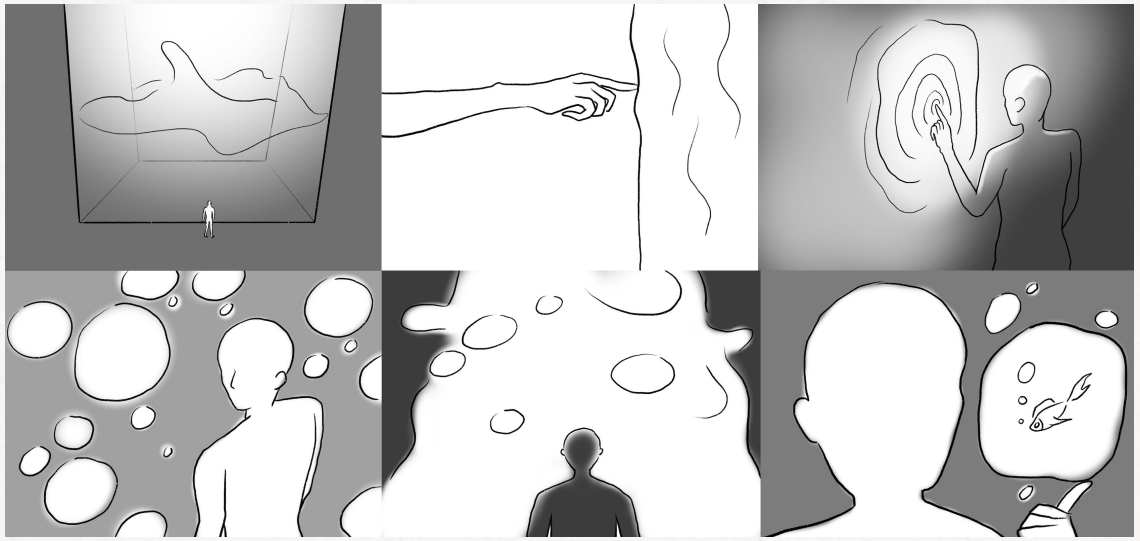


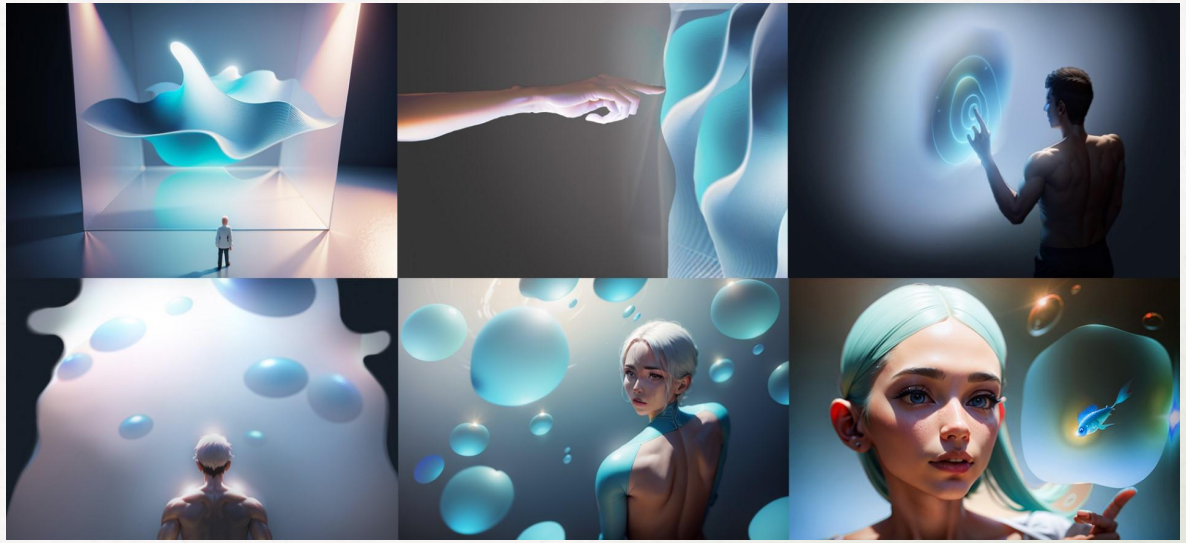
FMP

MIND-MAP


Final Idea
"Ripple"
Psychological Change
experiences
physical
body
emotions
abstract
mind
shapes
colors
lights
liquid
geometrical
creature
Climate Change
global warming
drounght
species extinction
creatures
forest fire

FMP STORYBOARD





After communicating the elements, movement paths, character backgrounds, and camera angles, Michelle created a storyboard, which is not exhaustive, but will be further expanded based on modelling and simulation later on.

The overall atmosphere will be mysterious, suspenseful, simple, elegant, clean and quiet ethereal. a story slowly told, where not much things happens but you feel touched inside which is what we were looking for.

FMP

SCRIPT

“Ripple”
The story starts with a big water screen and the main character. He walks to the screen, touches the surface, and the screen begins to ripple. Then he puts his finger inside the water screen, his body begins to change into water and transparent material. After touching, the water screen begins to float like several pieces of liquid, and they float around him. One of the liquids floats in front of him, he’s curious and touches it with his hand, and the things inside the liquid ball begin to change. Each time of touching, the liquid shapes changed, they morph from the liquid shape to the fish shape.

“Ripple” can be represented as visual ripples, it also provokes a psychological meaning, which means something changed in our deep hearts. A small action may cause a big effect, like a ripple. The idea shows the interaction between this person and the liquid, and the interactive process builds a connection between this person and the liquid. This character was isolated initially, but the "touch“behavior breaks the isolation in the end.

The presence of liquid not only creates the connection, but the character also gives life to it and the fish means new life. “Ripple” is demonstrated three times in the story, the first time is the water screen, the second time is the material change of this person, and the final one is the psychological change with the water balls and environments. Liquids can be manipulated with different colors and lights, which also shows the emotional resonance in the story.

FMP ASSIGNING ROLES

This lad9(my role):
Character Modelling
Character Animation
Environment Modeliing

This lady(my teammate):
Simulation
Materials Setup
Lighting

Team Work:
Object Modeling
Basic Animation
Motion Capture
Compositing
Music

FMP SHOOTING

https://youtu.be/Dqv-bFwEXRw?si=7vt8ulY8s9WynX9d

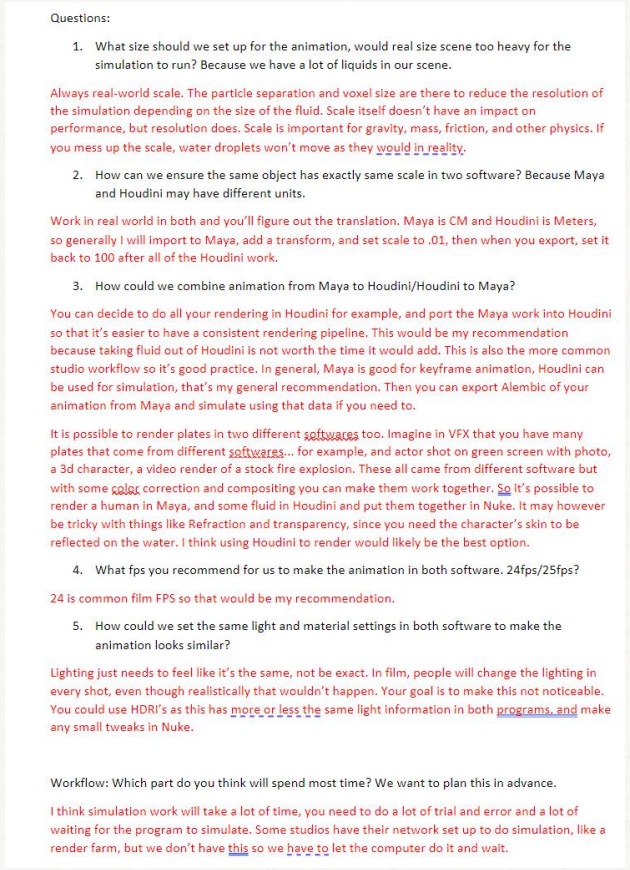
We then shot a reference of a human movement in order to animate the key frame more realistically. I then used Michelle's liquid simulation to try and composite a bit to see the effect and the movement of the liquid.

FMP

WORKFLOW

This time we are going to use the software MAYA, ZBRUSH, HOUDINI, NUKE, we are relatively unfamiliar with their co-operation, so in order to avoid a lot of unnecessary, unprofessional trouble, we write a good need to do all the models and simulations, write some of our doubts to our tutor sam. He gave us a lot of advice we find very helpful.

LINK TO THE DOCUMENT



Questions:

1. What size should we set up for the animation, would real size scene too heavy for the simulation to run? Because we have a lot of liquids in our scene.

Always real-world scale. The particle separation and voxel size are there to reduce the resolution of the simulation depending on the size of the fluid. Scale itself doesn't have an impact on performance, but resolution does. Scale is important for gravity, mass, friction, and other physics. If you mess up the scale, water droplets won't move as they would in reality.

2. How can we ensure the same object has exactly same scale in two software? Because Maya and Houdini may have different units.

Work in real world in both and you'll figure out the translation. Maya is CM and Houdini is Meters, so generally I will import to Maya, add a transform, and set scale to .01, then when you export, set it back to 100 after all of the Houdini work.

3. How could we combine animation from Maya to Houdini/Houdini to Maya?

You can decide to do all your rendering in Houdini for example, and port the Maya work into Houdini so that it's easier to have a consistent rendering pipeline. This would be my recommendation because taking fluid out of Houdini is not worth the time it would add. This is also the more common studio workflow so it's good practice. In general, Maya is good for keyframe animation, Houdini can be used for simulation, that's my general recommendation. Then you can export Alembic of your animation from Maya and simulate using that data if you need to.

It is possible to render plates in two different softwares too. Imagine in VFX that you have many plates that come from different softwares... for example, and actor shot on green screen with photo, a 3d character, a video render of a stock fire explosion. These all came from different software but with some color correction and compositing you can make them work together. So it's possible to render a human in Maya, and some fluid in Houdini and put them together in Nuke. It may however be tricky with things like Refraction and transparency, since you need the character's skin to be reflected on the water. I think using Houdini to render would likely be the best option.

4. What fps you recommend for us to make the animation in both software. 24fps/25fps?

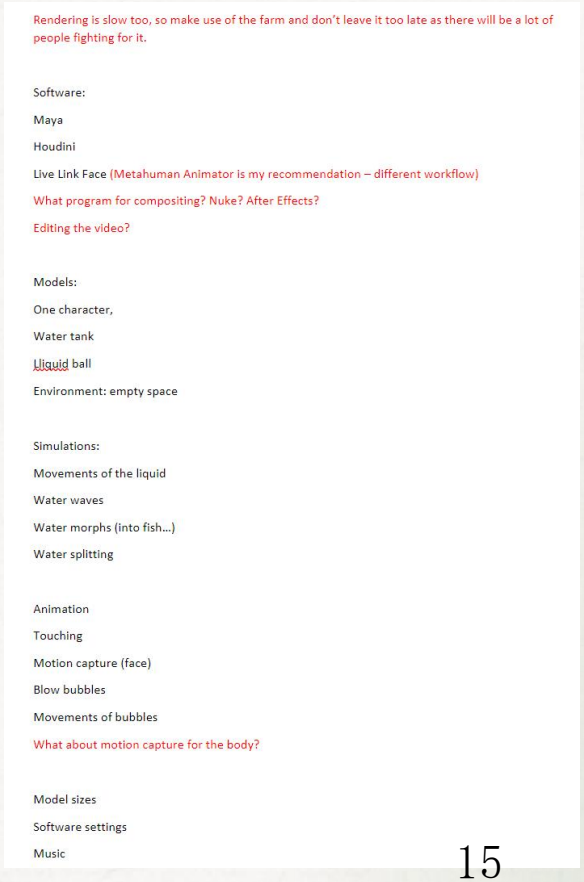
24 is common film FPS so that would be my recommendation.

5. How could we set the same light and material settings in both software to make the animation looks similar?

Lighting just needs to feel like it's the same, not be exact. In film, people will change the lighting in every shot, even though realistically that wouldn't happen. Your goal is to make this not noticeable. You could use HDRI's as this has more or less the same light information in both programs, and make any small tweaks in Nuke.

Workflow: Which part do you think will spend most time? We want to plan this in advance.

I think simulation work will take a lot of time, you need to do a lot of trial and error and a lot of waiting for the program to simulate. Some studios have their network set up to do simulation, like a render farm, but we don't have this so we have to let the computer do it and wait.



Rendering is slow too, so make use of the farm and don't leave it too late as there will be a lot of people fighting for it.

Software:

Maya

Houdini

Live Link Face (Metahuman Animator is my recommendation – different workflow)

What program for compositing? Nuke? After Effects?

Editing the video?

Models:

One character,

Water tank

Liquid ball

Environment: empty space

Simulations:

Movements of the liquid

Water waves

Water morphs (into fish...)

Water splitting

Animation

Touching

Motion capture (face)

Blow bubbles

Movements of bubbles

What about motion capture for the body?

Model sizes

Software settings

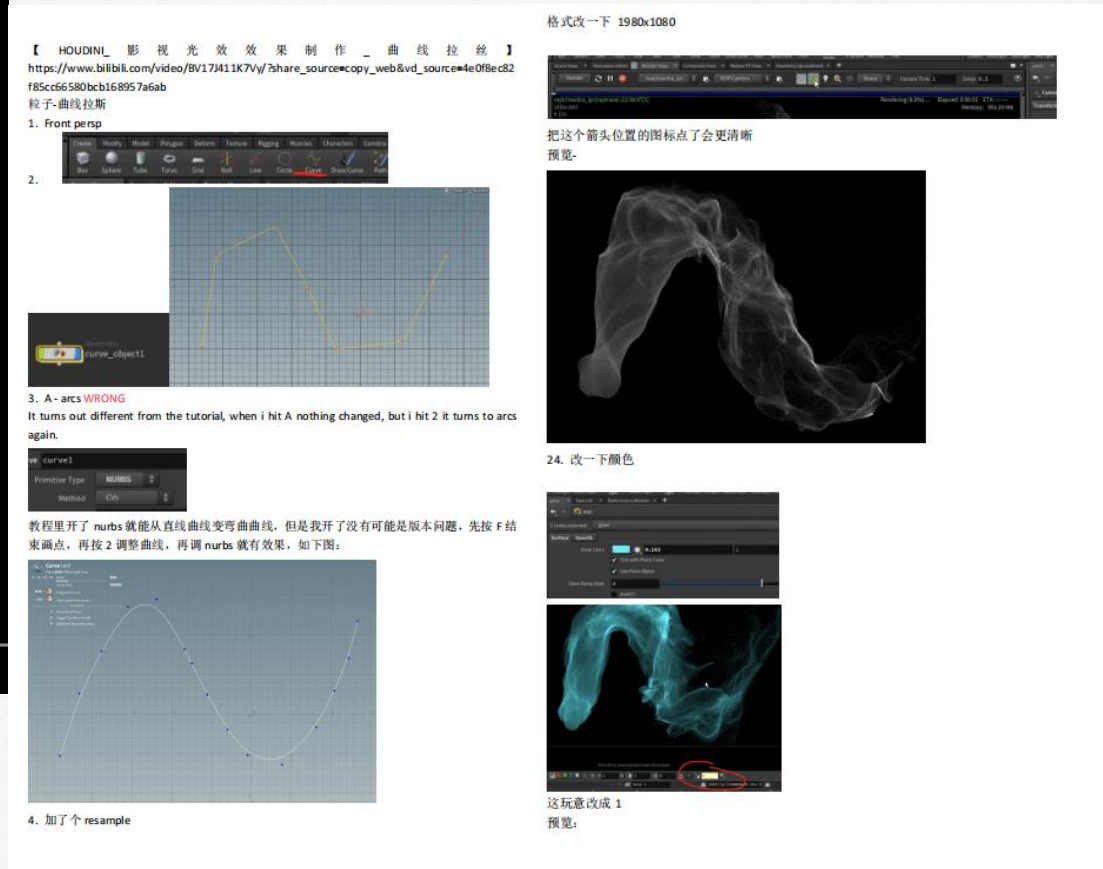
Music

FMP SIMULATION TESTS

I did a bit of particleflow simulation testing as I'm new to Houdini and was intrigued, it's not my main position but I wanted to try and do some visuals to expand our reference range.

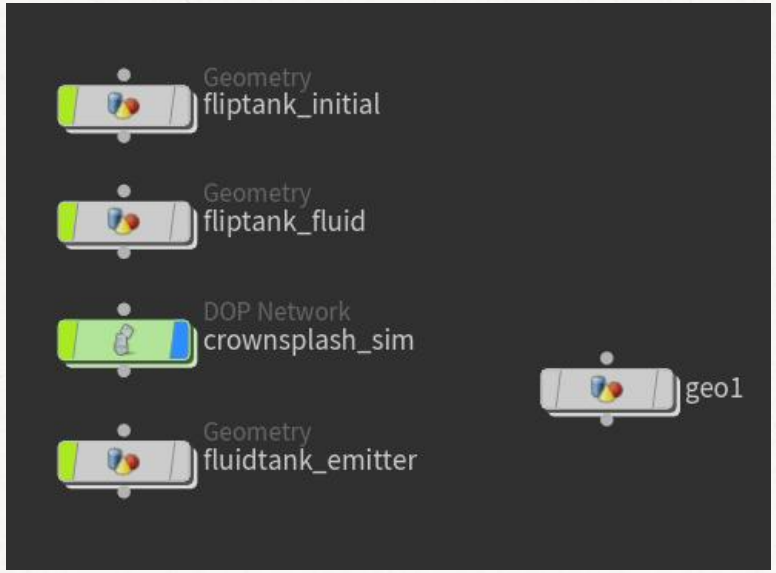
https://youtu.be/YIVZKJv9sD4?si=7u3VEkCx6syuutqj

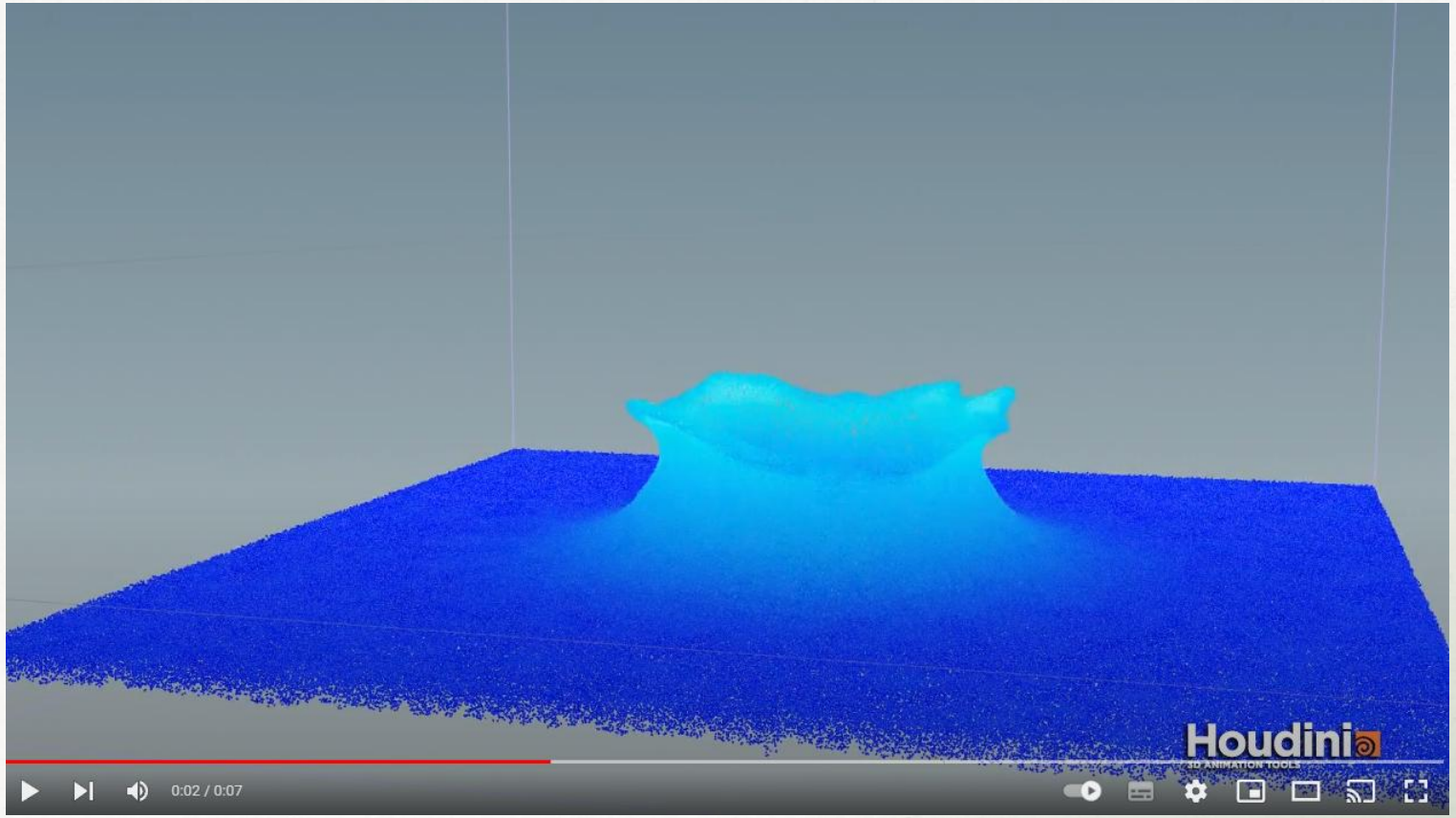
Working Process:



FMP SIMULATION TESTS

And also the tests of the crown splash. Which shows the simulation of water is quite big process but it was fun to work on.
I also tried the Redshift plugin and it's textures look really good.
The final splash is still not neat enough and the simulation still needs several attempts to achieve the best effect.





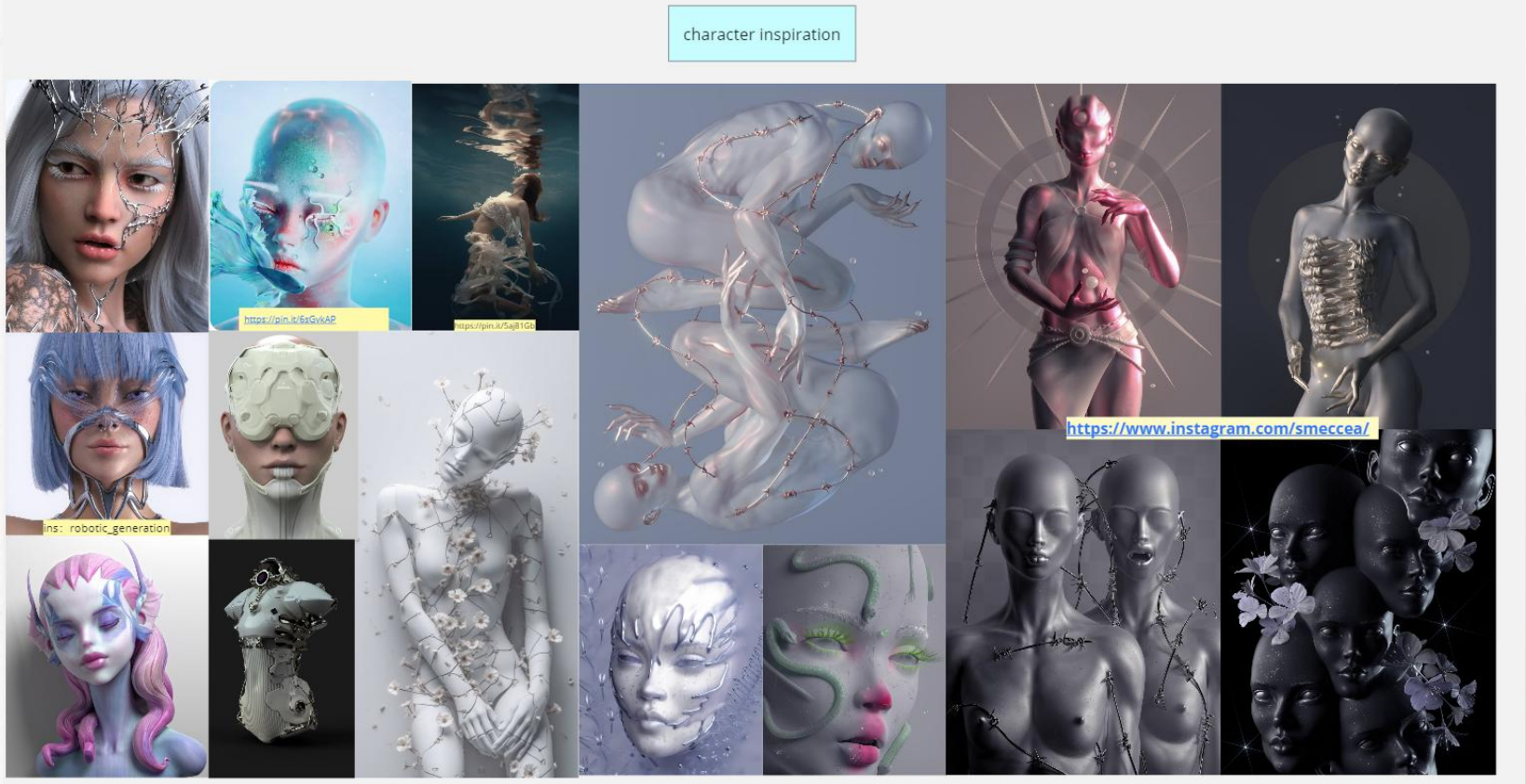
https://youtu.be/zrhmJZFfQgI?si=ov0ziyPrG1TyzskN

FMP

CHARACTER DESIGN

Key words: NO HAIR, Eyeballs without pupils.Clear body structure
Clearly textured skin， Metal element， Glitter. Virtualisation. NFT.

Stable Difusision works



We wanted characters that were AI-like humans with a futuristic, cyberpunk vibe, but without the mechanical elements. Because the theme is human-liquid interaction, the otherworldly style should avoid elements that are too complex and conventional. How to make a character design clean but interesting to convey the right feeling is a tricky question.

FMP CHARACTER DESIGN

This is a digital painting I created, based on a primitive female human model. Visual Appearance: The lack of hair and no pupils bring a sense of aliens that are more mysterious and unique, but there's also a reason that hair is so hard to make look good and time-consuming in modelling. Nudity Returns to Humanity Itself. Sea creatures-----coral and fish scales are added and the blue theme echoes our theme ‘ripple’. Try to go for making her look more appealing and aesthetically pleasing. A female figure was chosen because women make people feel softer and warmer, and having the protagonist take on the characteristics of a fish fits well with the story as well, when the liquid takes the shape of a fish, showing that in fact the two are one and attracted to each other.

Procreate works

FMP

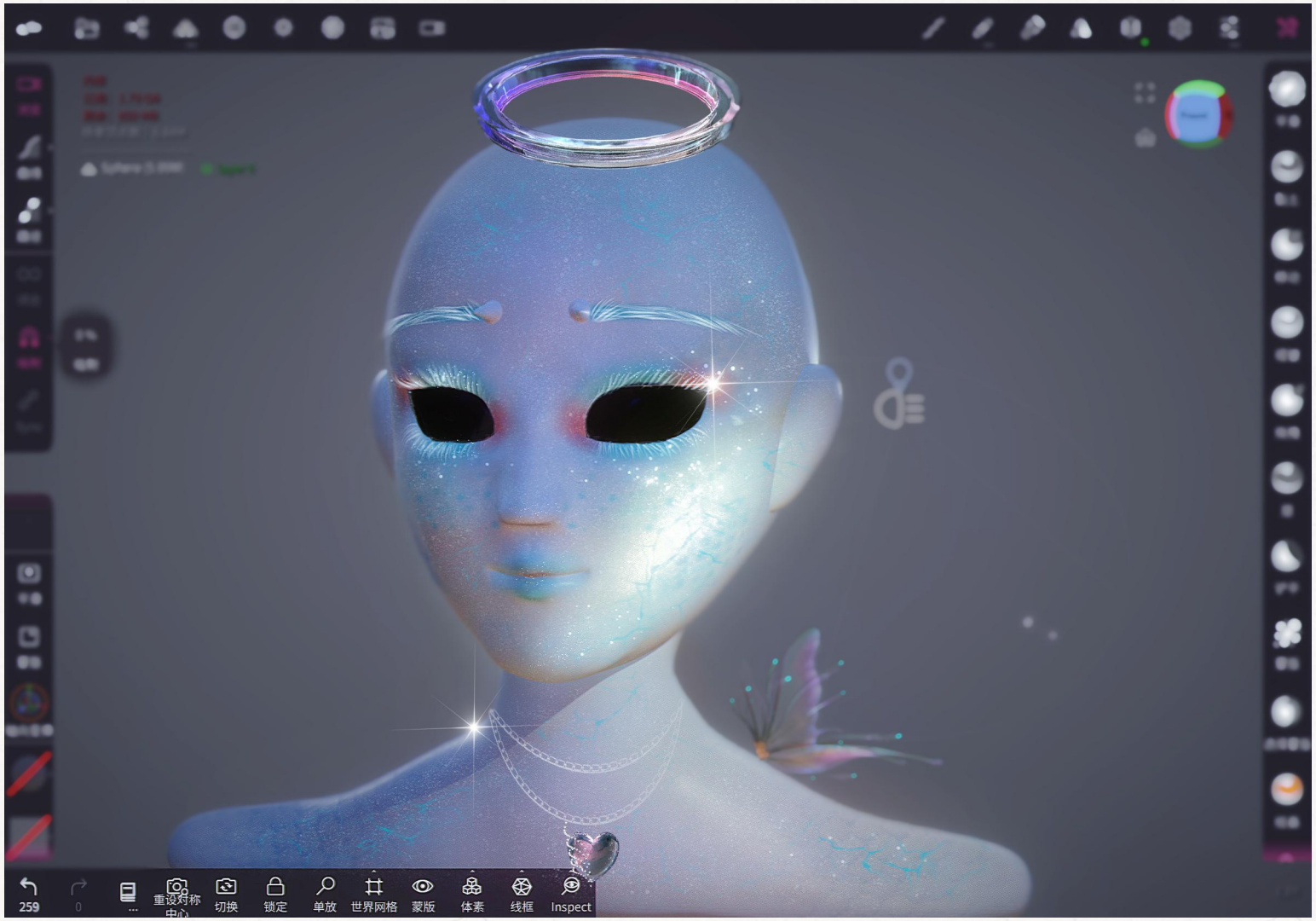
CHARACTER DESIGN

In observing marine life, it has been found that their colours are beautifully designed by nature, with harmonious colour combinations and interesting spots. When considering materials, I personally feel that the skin of aquatic creatures has a rough but crystalline feel to it. So these elements were adopted. To reflect the connection to water, I also add some water ripples, and the end result is quite pretty, with a texture of blue veins.

FMP

CHARACTER DESIGN

Nomad works:At this stage only the head



Backstory: In an empty place, she stood in the centre as if she had just arrived, and as if she had been born here. The whiteness seemed like an endless black hole, expanding infinitely in every direction, and the solitude seemed limitless. She was the only human here, or maybe not? Time passed aimlessly, but it had nothing to do with her, she was just here as an individual. Suddenly, a wall of water appeared in front of her, and a second life form capable of autonomous movement was about to appear before her eyes.

Perhaps she represents the first single cell to appear in this world, perhaps she represents the lonely life of doom.

‘This earth is still turning, your appearance whatever it represents, it means infinitely more to me’

FMP

CRITICAL APPRAISAL

As of now, our project is running smoothly, completing approximately one-third of the overall. Neither my teammate Michelle nor I have fallen behind, and it's important to be on call to keep the project consistent. For scheduling, we would accomplish one or two small goals each week and share them with each other to see if they were the results we wanted. As for teamwork, my teammates and I are good communicators, we will bring up any problems and respect each other's ideas, Michelle is very good at simulation, I'm very happy to have her as my teammate, and she has given me a lot of suggestions for my character design.

I'm very excited about our ideas and progress so far, this idea is an extension of our summer project, it can satisfy my teammate's desire to do liquid morphing and also continue my exploration of human modelling. Also I'm glad we got to try something more abstract instead of doing an overly complicated story. This project, I also try a lot of simulation in Houdini. In fact, the character design in ZBRush also tried Nanobrush to do fish scales, but failed, and then in Nomad found that the normal mapping also works. For the sake of the professionalism of the project, we are completing every step very rigorously, pushing each other and encouraging each other.

During the experimental stage, there were also a lot of problems. For example, in the simulation, at the beginning of the Hounidi always made mistakes, and finally gave up. But after starting from the beginning again many times, suddenly one day a complete rendering of a result, let a sense of quantitative change produces qualitative change. Moreover, Houdini is a node format software, so if the details of one part are wrong, it will affect the subsequent nodes. For all the experiment I did after getting failed, I would slow down to make sure that every step is correct. It's important to accept that problems happen all the time, and that if you try to solve them, you'll get good feedback.

My next goal is to use ZBRush to morph the overall human model into the shape we want (the model in the PDF is still in the style display stage), then add skin textures and materials. Then it's time to rigging and animate it, followed by environment modelling and compositing.

For the teamwork, we may try motion capture for the facial expression, and the final compositing and music selection is also a teamwork.

Overall, after three years of working on the projects the formation stage of the idea has gone very well, having seen more of the artist's work, and recent trends in style and aesthetics. Also so far I've been able to use the new software Stable Diffussion and Houdini with good skills because of the experimentation, while Zbrush still needs to be practised. I hope our team can use our holiday time wisely and keep the project going steadily.

Bibliography

Anadol, R. (2023) *Quantum Memories, Digital Artist Refik Anadol Has Hypnotized the World With His Swirling A.I. Art Landscapes—Here Are 5 Essential Works to Know*. Richard Whiddington. Available at: https://news.artnet.com/art-world/5-refik-anadol-works-to-know-2259071.

Chekhov, *A.P. et al. (2014) The Little Trilogy: The man in a case, gooseberries, about love*. Philadelphia, PA: Calypso Editions.

i.am.maltsev (no date) *In #loop we trust*. Available at: https://lynkfire.com/Alex (Accessed: 01 November 2023).

Jacobs, Z. (2021) *Tutorial: Crown Splash From Scratch*. Available at: https://www.youtube.com/watch?v=_UaWj8AxRIk (Accessed: 05 November 2023).

The last airbender (2010). 31 January.

Milinski, P. (2022) *The Botanical Gardens*. Available at: https://www.instagram.com/paul_milinski/?utm_source=ig_web_button_share_sheet&igshid=MmVlMjlkMTBhMg==.

Toy Story (1995). Walt Disney Pictures, Pixar Animation Studios. 19 November.

Training, M. (2017) *VMT 012 - HOUDINI - Particles Follow a Curve*. Available at: https://www.youtube.com/watch?v=pBZM387_SYg (Accessed: 07 November 2023).