Week1

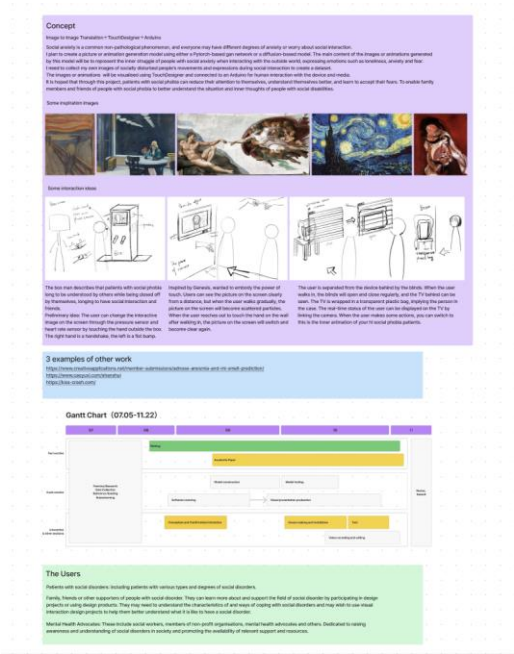
In the first week, my main work was to conceive the topics for the advanced project. I chose some topics that I was interested in and did some brainstorming. I came up with some themes, such as the intimate relationship between people, or how to reflect the phenomenon of objectifying women and speak for women? Because I have social anxiety, I also want to make more people understand and empathize with people with social anxiety. I hope to integrate the current advanced artificial intelligence knowledge into this project and bring some thoughts to people through design. I made a Figma (Msc project - Figma) to show my ideas, and had a tutorial with my supervisor Jennifer Sykes. Jennifer was very kind and gave me some suggestions on the theme of the project. She respected my ideas. Jennifer shared some websites and examples related to installation design. I browsed these web pages and started looking for inspiration.

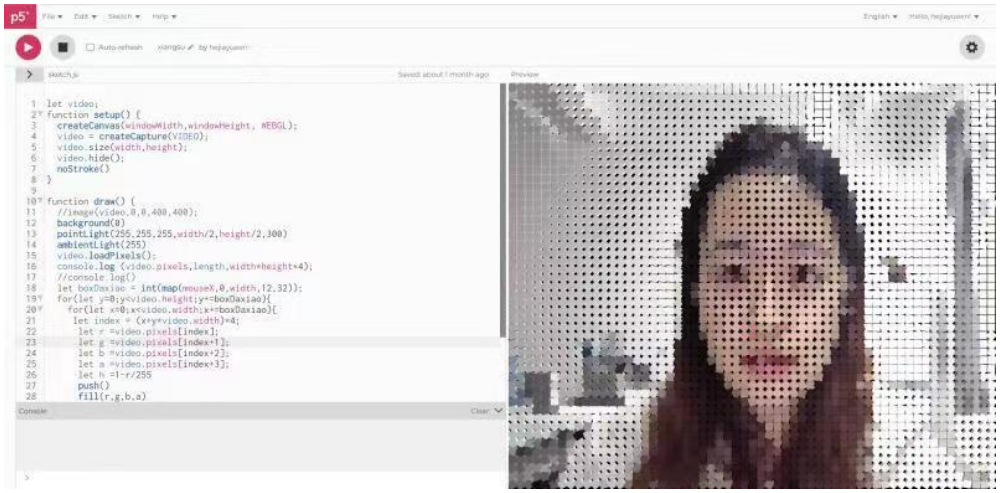
Week2

I have summarized my inspiration, but I'm not very clear about what I can produce. Through my personal experiences, I have developed a heightened interest in the psychological activities of individuals with social anxiety disorder. Consequently, I aim to explore the relationship between human psychology and the intersection of artificial intelligence and art. I have gathered relevant articles in psychology, including those on the causes and treatments of depression and social anxiety

disorder. Reading these articles and books has provided me with a foundational understanding of psychology.

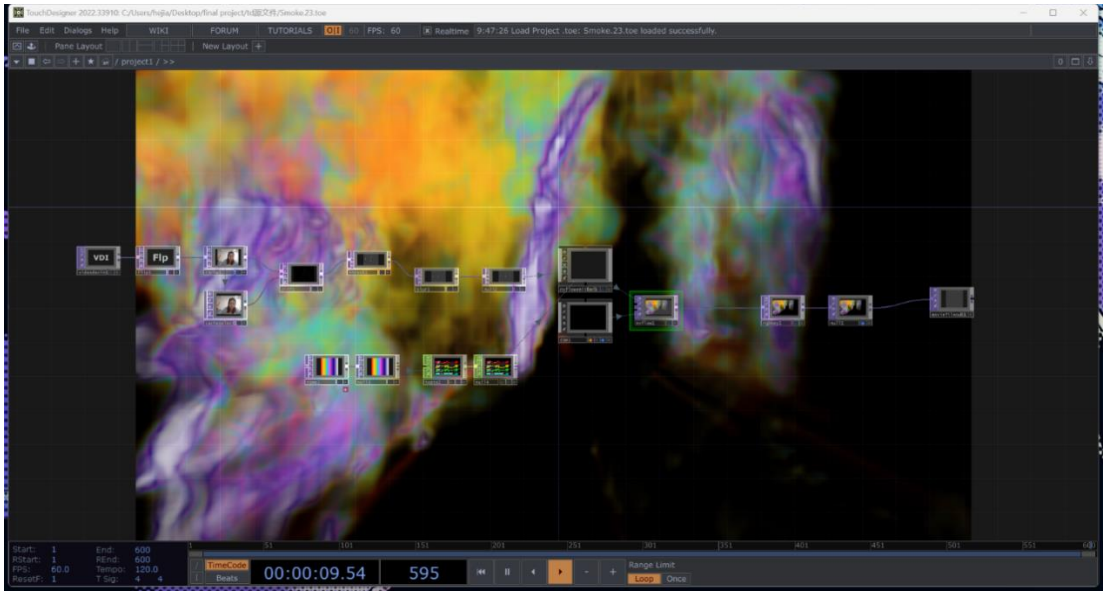
In this project, I hope to incorporate some intriguing interactive designs. The challenge that has been persistently on my mind is how to create an experience that allows users to enjoy interaction and effectively reveals their inner thoughts. Through divergent thinking, I have contemplated various forms of expression and interaction methods. I have sketched some rough designs for the installations and created a Gantt chart for the project (MSc Project – FigJam (figma.com)). This week, I had my second tutorial, during which Jennifer provided valuable suggestions after reviewing several design proposals. I decided to try some things on P5.js first.

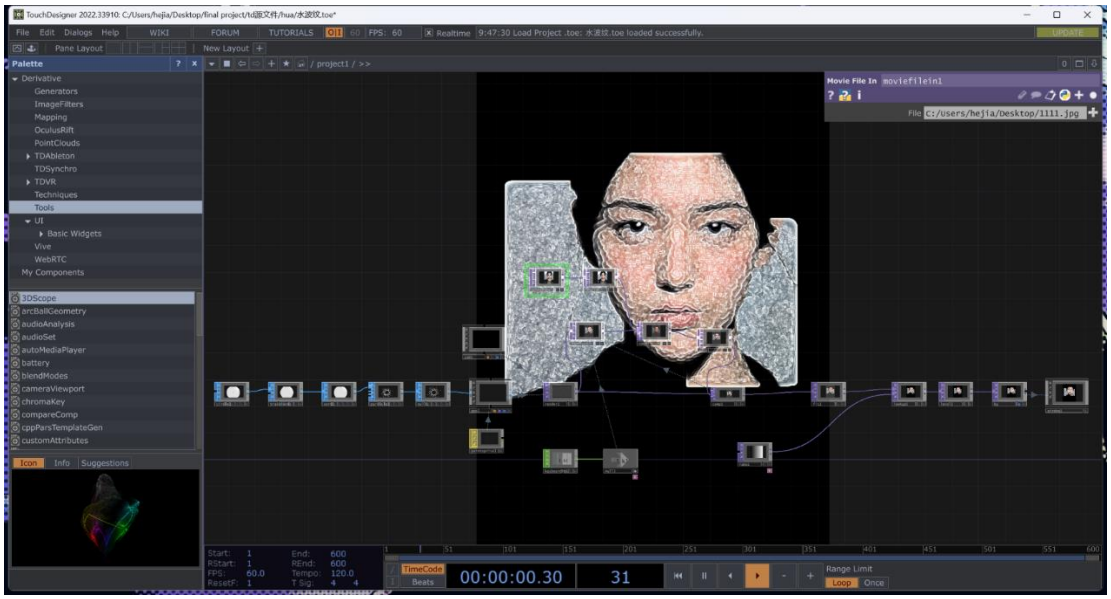


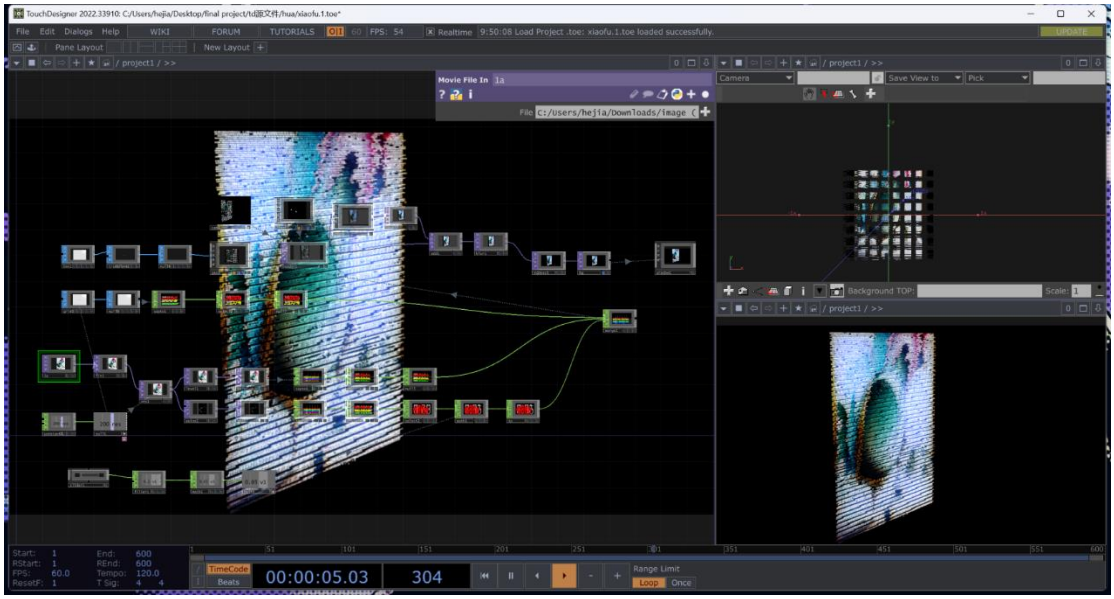


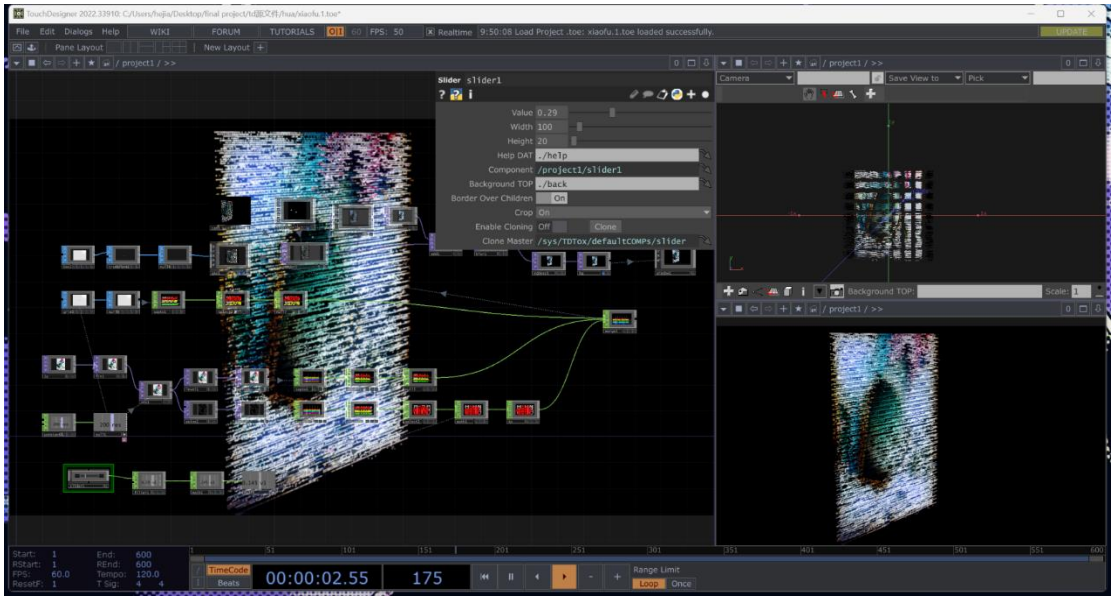
Week3

During the summer vacation, I read some papers related to interactive installations, and tried to travel with friends and explore some issues about social anxiety. After that, I sorted out the design theme and clarified the design goal. By consulting a lot of information and combining my personal feelings, I think that many times the reason for social barriers is that people cannot express their thoughts and feelings well, leading to resistance to socializing. If I can help users bravely face their inner selves, can they socialize better? And will enhancing the participation and entertainment of the device make users more willing to join in? I conducted a survey on this and gradually became interested in the expression of human psychology and subconsciousness and artificial intelligence painting technology. In this work, I hope that the device I make can reflect the psychological ideas of people, and let users participate in the device use easily through interactive play, and enjoy art. During the summer vacation, I also learned about Touchdesigner. This week I also tried to use Touchdesigner to make some artistic effects and tried the combination of Arduino and toucherdesigner interaction.









Week4

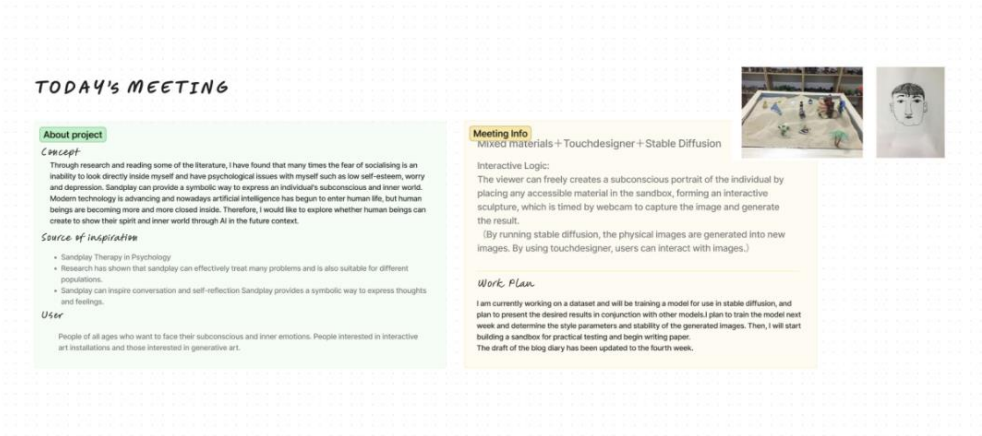
I began to devise the design logic of the installation. I explored generative art and algorithmic art, and for AI painting, I had some knowledge of Midjourney, but Midjourney had some usage constraints. I also recalled the Generative Adversarial Networks (GANs) that Louis taught in class, and an example that Mick showed us, Learning to See, which uses pix2pix, which are well-known and effective technologies and models for image generation. So I attempted to use pix2pix for my first trial, but the outcome was not satisfactory. The quality of the paintings produced by pix2pix was not very consistent, and the style of the images was hard to control. It did not match my expectations. After that, I discovered that diffusion models are very popular this year, and learned about stable diffusion, which is a technique for enhancing the training process of generative adversarial networks (GANs). The main

benefit of Stable Diffusion technique is that it boosts the stability of GANs training, lowers the risk of model collapse during training, and improves the variety and quality of generated images. And it has a broad range of applications, such as text to image, image to image, and other operations. These are more compatible with my requirements, so I started to deploy locally and learn and try to use stable diffusion to generate images.

Week5

By reading psychology books and consulting my previous psychologist Mrs. Sun, I learned that sandplay therapy is often used as an effective way to treat some psychological disorders. Sandplay therapy provides a symbolic way of expressing thoughts and emotions. Sandplay therapy can inspire self-reflection, reflect the inner and subconscious, and is suitable for different groups of people. So I wanted to use the concept of sandplay therapy, to provide the audience with an immersive experience, where they can participate more deeply in the process of creation and expression.

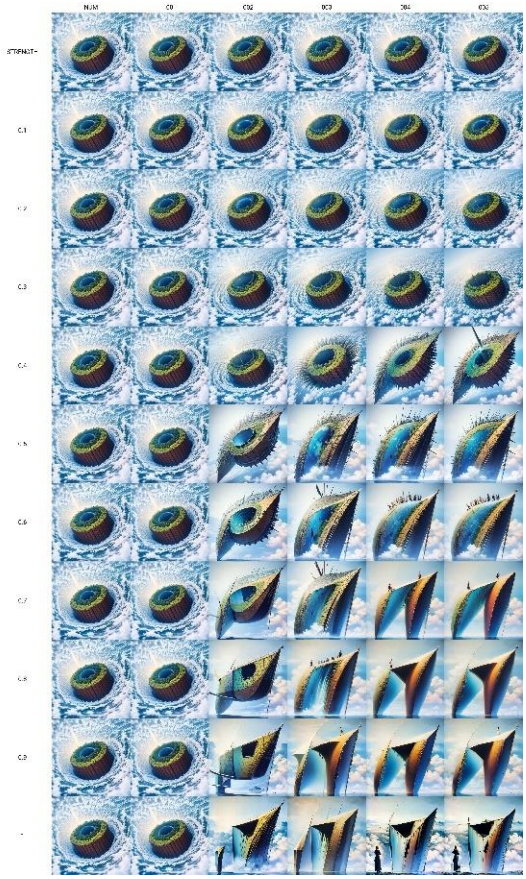
After learning the principles and usage of Stable diffusion, I first tried to use prompt words to generate some images, and I was very satisfied with the results. Then I started to think about what kind of painting style to use for the presentation of the work. I have organized my thoughts(project – FigJam (figma.com)), and did some brainstorming. There are many kinds of painting styles related to psychology, and I finally chose to use surrealism. Surrealism advocates breaking through the limitations of logic and reality, and expressing the world of dreams and subconsciousness. Surrealist paintings use exaggeration, unreal, and dreamlike scenes to try to express the subconscious and extrasensory experience. This is closely related to the study of dreams, subconsciousness, and psychological conflicts in psychology.



Week6

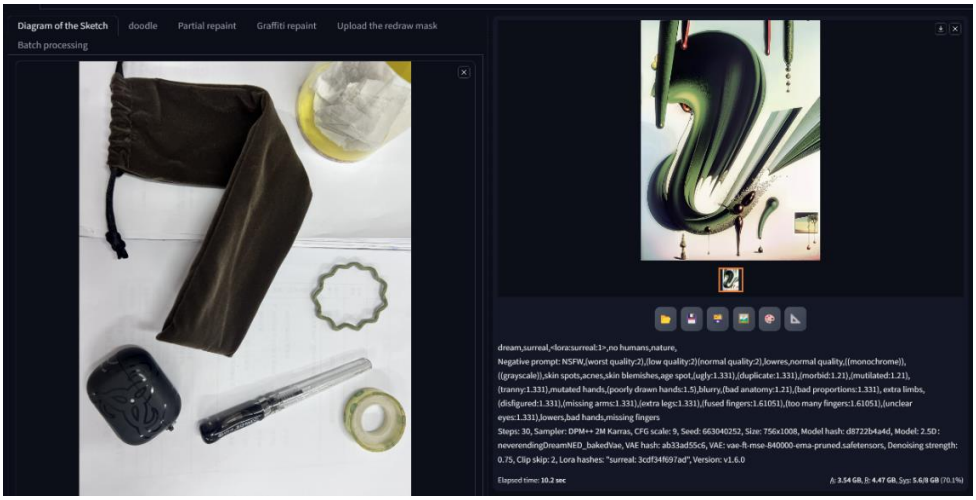
This week I had my third tutorial, and I got some suggestions from Jennifer about the interaction and some recommended papers and references. Next, I started to make

the models I needed to use, because the model training and use would be limited by the GPU, so I planned to train the LoRA model. Then I started to collect the dataset, most of my pictures came from Pinster, and some from X and Google Images. In order to improve the user's recognition of the generated paintings, I selected some representative surrealist painters such as Dali, Magritte, etc., including some of their famous works such as The Son of Man, The Lover, etc. I collected 40 surrealistic paintings related images as the dataset for training the model, and first cropped these images to 512×512 size, and then created tags for each image. This was a time-consuming project, because I had to describe the content of each image as detailed as possible, the clearer the description, the better the painting effect of the final model. Next, I started the model training, and I designed to learn one image 20 times. The training parameters were: max train epochs:10, train batch size:1. The learning rate and optimizer parameters were: unet lr:1e-4, text encoder lr:1e-5, optimizer type:AdamW8bit. After testing and comparison, the final surrealistic model Surreal was born! I couldn't wait to try it!

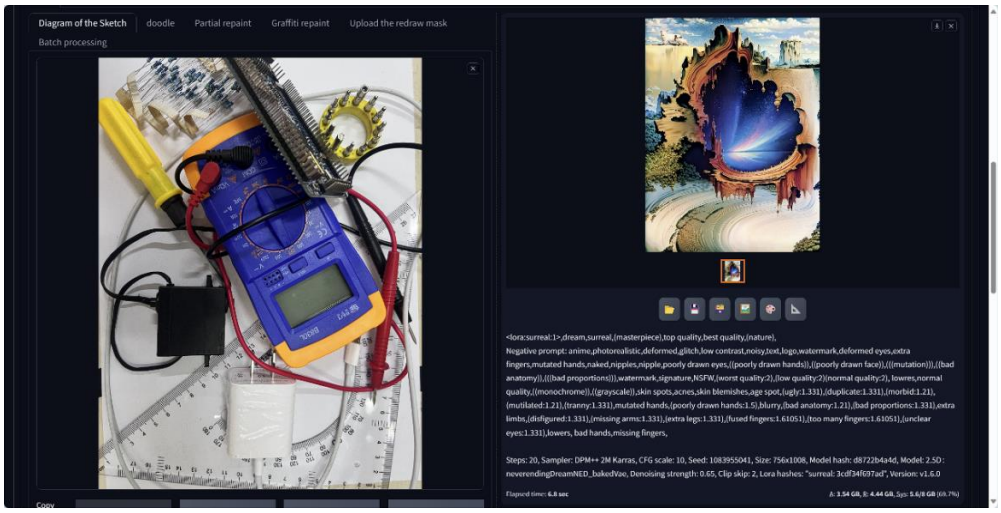


Week7

I started simulating tests on the trained model, using a photo of randomly placed everyday items. The feedback received was very positive：



In order to showcase the best possible outcomes, I adjusted parameters such as prompt cues, negative prompts, and iteration steps to continue testing. After continuous adjustments to the parameters, I achieved satisfactory results：



I showcased the generated images to Jennifer, and she also found them impressive. She suggested that I consider the relationship between users and the sand tools, how to obtain desired objects, and how to present the results. Next, I started contemplating how to connect the webcam for capturing real-world scenes and how to showcase them. I initially attempted to use Touchdesigner for webcam connection, which can access the computer's camera. However, accessing the local API of Stable Diffusion became a new challenge. So, throughout the latter half of the week, I continued to explore ways to access the local API.

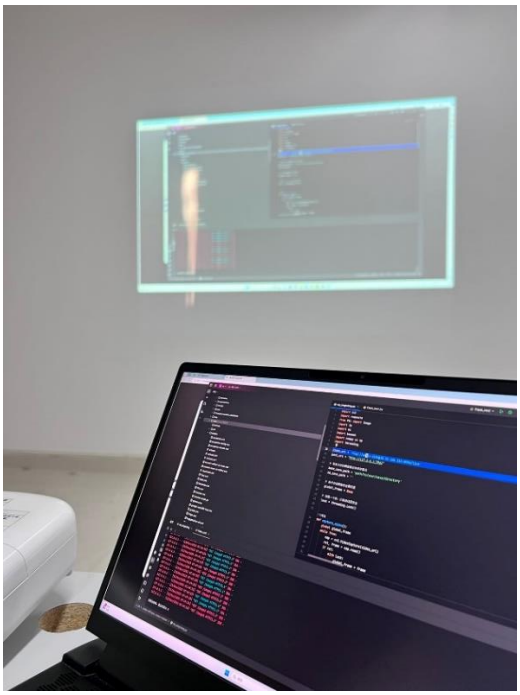
Week8

Touchdesigner's attempt to access the Stable Diffusion API was unsuccessful after numerous tests. Consequently, I began contemplating alternative methods for presentation. Determining the interface for showcasing became my primary focus this week, and I aimed to design it myself. I started experimenting with creating a

webpage, and during the process, I had the idea of incorporating a surrealistic painting style characterized by a sense of fluidity and levitation in the objects within the image. I decided to integrate this feeling into the presentation, allowing users to interact with the generated images. After experimentation and learning, I settled on using SVG and CSS to achieve a liquid flow effect. The webpage was coded using HTML, CSS, and JavaScript, leveraging features such as mask-image masking, feTurbulence, and feDisplacementMap filters, canvas drawing methods, and TimelineMax animations.

Week9

In the first half of this week, I continued building the webpage and addressed any bugs that arose. In the latter half, I focused on constructing the sand tray scene. After setting up the sand tray, I began debugging. Initially, there was a discrepancy between the images displayed on my webpage and those on the Stable Diffusion web UI. This discrepancy could be attributed to deviations during camera capture or incomplete parameter additions when calling the API. Consequently, I made continuous modifications to the code and conducted testing. Simultaneously, adjustments and testing were performed on the projector. After resolving the code issues in the presentation section, I outlined the paper and devised plans for user surveys, including drafting a basic questionnaire.



Week10

I organized a two-day experiential exhibition, inviting individuals from different age groups to participate in user testing for the installation " Heartview ". Surveys with basic questions were distributed to 12 participants. After experiencing the installation, in-depth individual interviews were conducted with three participants based on fundamental questions from the questionnaire. Through these interviews, insights were gathered regarding their perspectives, experiences, and suggestions concerning the installation. The project was evaluated, and a demonstration video showcasing the use of the installation was recorded during the process.

Week11

Video editing, writing, and completion of the paper.