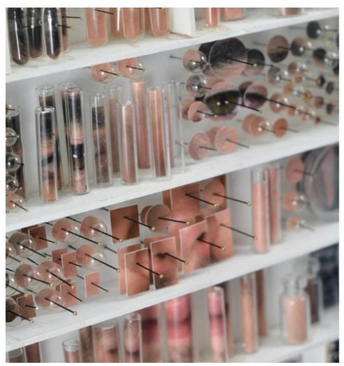
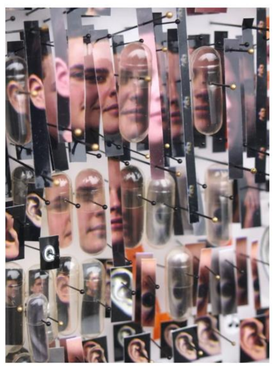
SATELLITE ECHO

Satellite:
We navigate a web of social relationships—be it with parents, friends, or partners—where subtle shifts in power dynamics constantly unfold. No one can remain the center of a relationship forever. Like celestial bodies, changes in gravity pull one party to the center while the other drifts as a satellite,distorting the rings and losing their orbit.
Even amidst the unease of losing control, we strive to stay within each other's paths.

Echo:
In the age of cybernetics, we are trapped in predefined social roles, struggling with a sense of identity. The vase, a familiar form, serves as a metaphor for societal rules in this work.
As viewers interact with the mirror's reflection, they step into the role of the vase. The chaos of their free will blurs the boundaries of these rules. In gazing into the mirror, they witness the echo of their own self.

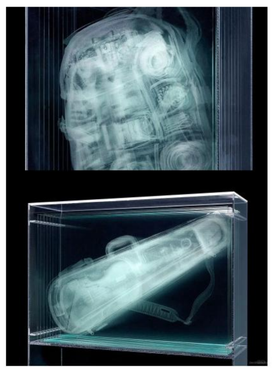
Concept





Michael Mapes

David Spriggs



Javier Perez

Monica Piloni

Hugo Servanin

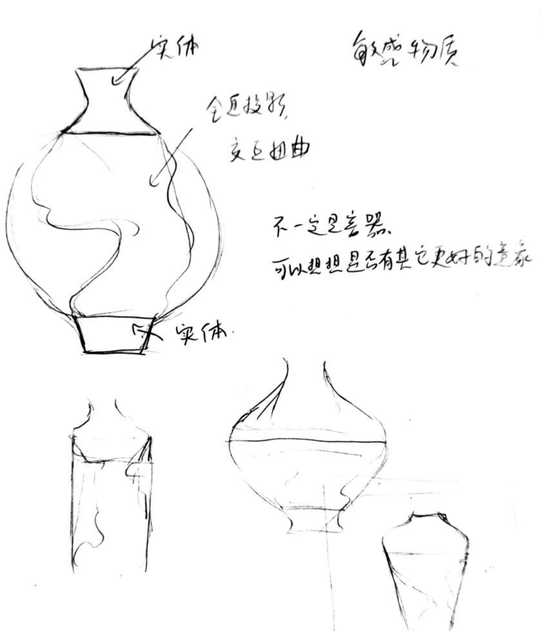
Yosman Botero

Jeremy Lepisto

After completing unit 2, I discovered an interest in the forms of objects suspended within containers.
At this stage, I was still unclear about the underlying reason for this fascination. I actively searched for similar works that intrigued me, attempting to identify potential connections among them.

As my research progressed, I gradually realized that containers represent boundaries, fixed forms, and rules—something interpretable and orderly. Technology revolves around capturing and controlling, while reality inherently resists being fully captured. Any form related to capturing —be it photographs, sounds, or data—are merely fragments of reality. In the age of technology, our perception is confined to the tangible, while we ourselves remain intangible.

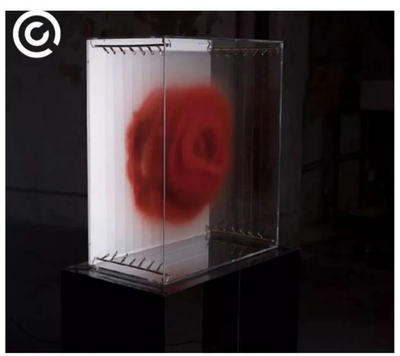
Bouke de Vries



certain forms

What intrigues me about the chaotic matter within containers is how it embodies the uncapturability and complexity of reality. In a sense, it also reflects the confusion modern individuals face regarding identity.
I began to explore the boundaries and connections between the tangible and the intangible, as they metaphorically represent societal rules and the self, respectively.

Isabel Alonso vega



uncertain forms

Based on the practices from Units 1 and 2, I created a chart to organize my thoughts more coherently around the core of my research and practice. This foundation has given me a clearer direction for the practices in Unit 3.

CORE

topic:
Technology is an emphasis/ overexposure of reality.
Reality is anti-capture

Uncertain forms(Humanity/reality)
and
Certain forms(Tech)

interactive

A container is like a mirror, symbolizing a person.

A container represents a boundary, a fixed form, a set of rules. It is interpretable and orderly. When a person passes by, the contents within the container break free from the constraints of form and boundaries, hinting at the complexity and elusiveness of human nature.

Toshiya Masuda

U1

topic: blurred boundary between human and machine

form:mosaic

Han Hsu

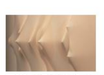
Milo Hartnoll

Michael Mapes

form:wrap

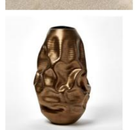
Malin Bulow

Cameron Luft



Zilia Sanchez

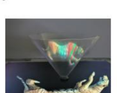
form:distortion



Nicholas Arroyave-Portela

form:hologram
(anamorphic projection)

David
Spriggs



Pepper's
ghost

U2

topic: distorted memory caused by algorithm

form:mosaic(digitize)

U3

topic: Break free from the safe form imposed by technology and embrace the complexity and randomness of reality.

Michael Mapes

Hua Hua

Lulu

Isabel Alonso vega

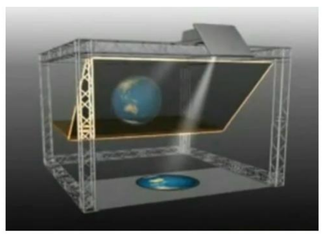
Dominic Harris

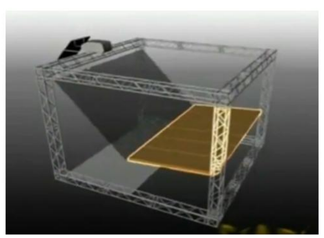
WIP Show

Dominic Harris
Flutter Hologram: Pendulum

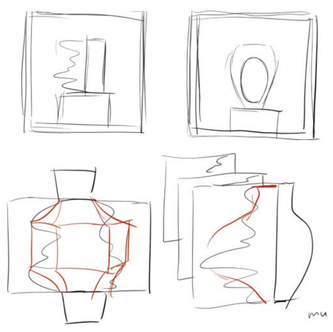
I came across the work of Dominic Harris, where butterflies seem to respond and flutter as the viewer approaches. Dominic skillfully blends the virtual and the real in his creation. The butterflies and the hanging rings above are virtual elements, as they are dynamic, while the static components, such as the base ring and the glass dome, are physical.

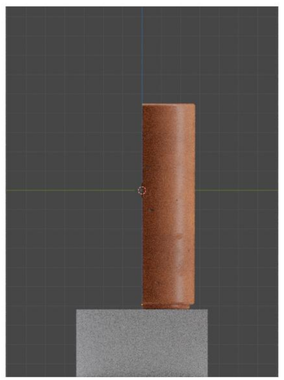
A screen that aligns with the shape of the container

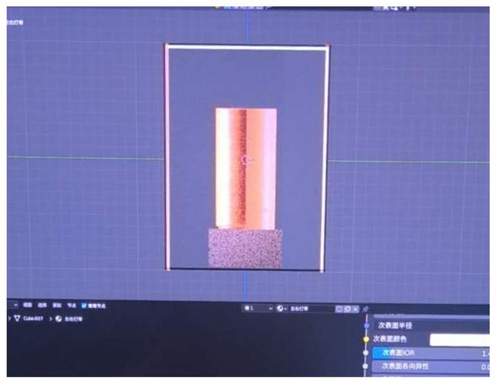


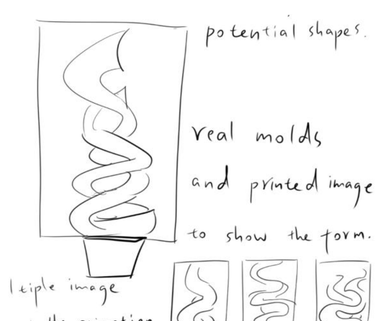


In this installation, he employs the Pepper's Ghost technique. Upon closely analyzing the related videos and photos, I found that the screen is concealed within the left compartment of the box. A 45-degree angled reflective panel is placed at the front of the box to project the screen's content.

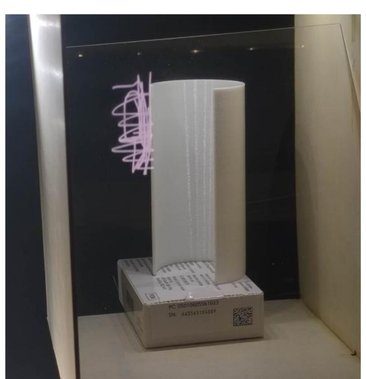




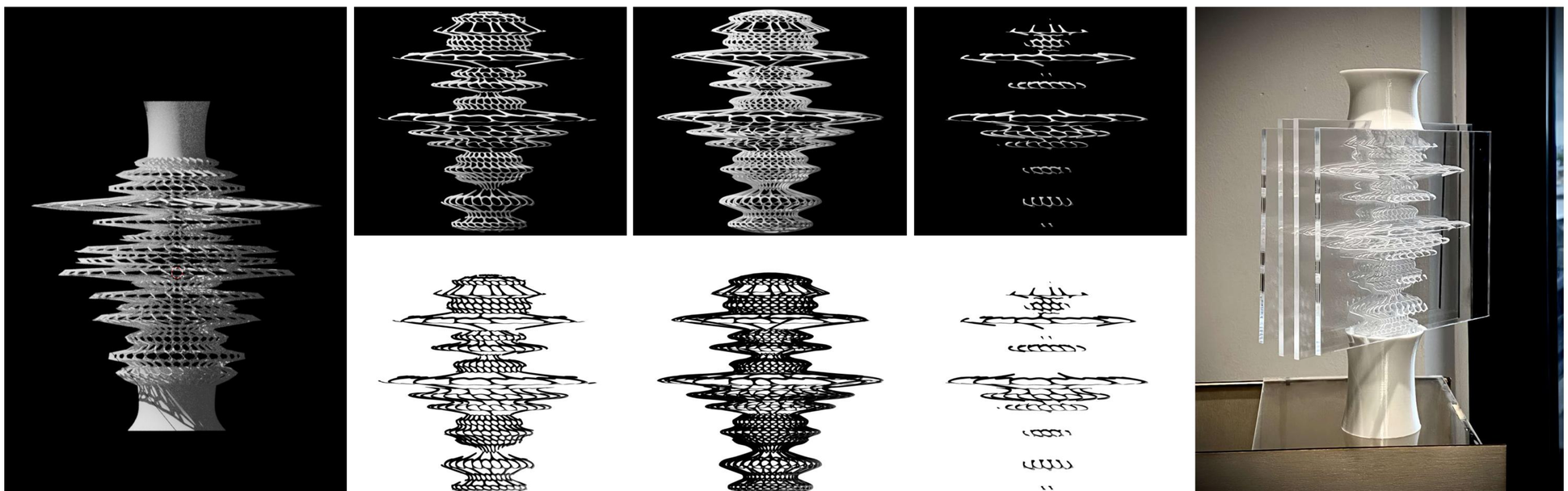




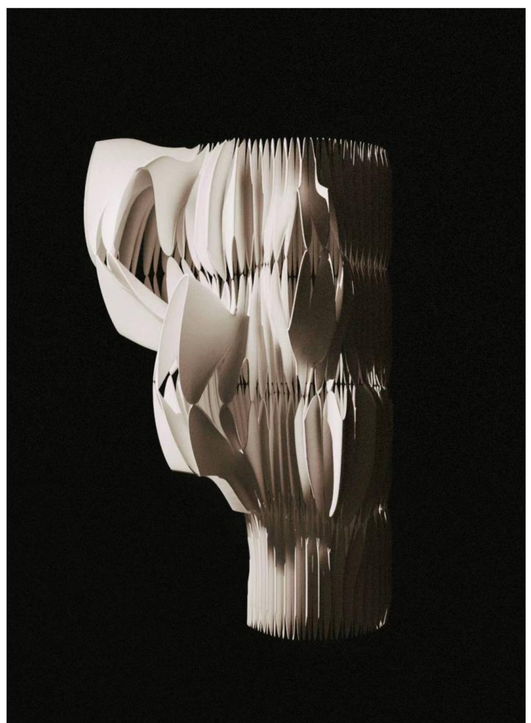
Next, I conducted research on the Pepper's Ghost technique and, following online tutorials, performed a simple experiment using a shoebox and spice bottles. However, a significant issue emerged during this experiment: the projected elements appeared much brighter than the actual objects. This led me to consider how to control or enhance the transition quality between the virtual and the real, aiming to make the overall effect look more natural.

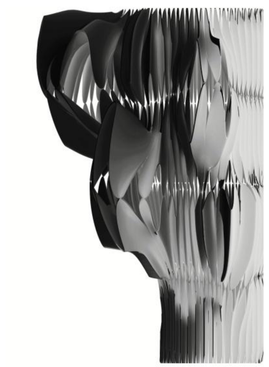


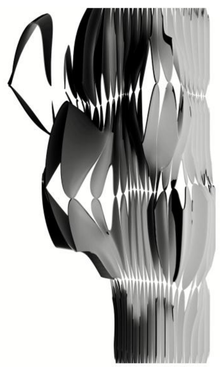
I 3D printed some samples and conducted a few simple experiments combining virtual and real elements. I found that the highlights of virtual content blend more seamlessly with real objects. The highlights (the brightest areas) of the real objects effectively blur the boundary between the virtual and the real.

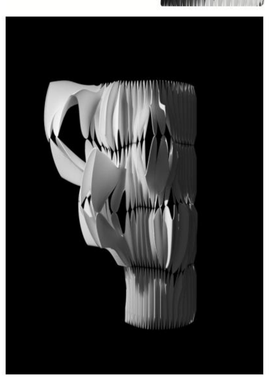


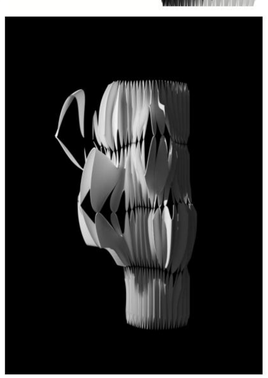
I created some samples in Blender to simulate the effect of blending virtual and real elements. During this process, I discovered that achieving a natural integration between virtual and real requires careful lighting coordination. Considering that virtual content often has higher brightness, placing light strips at the back of the box generally works better. This placement illuminates the contours of the real objects, making the transition between the virtual and real appear more seamless.

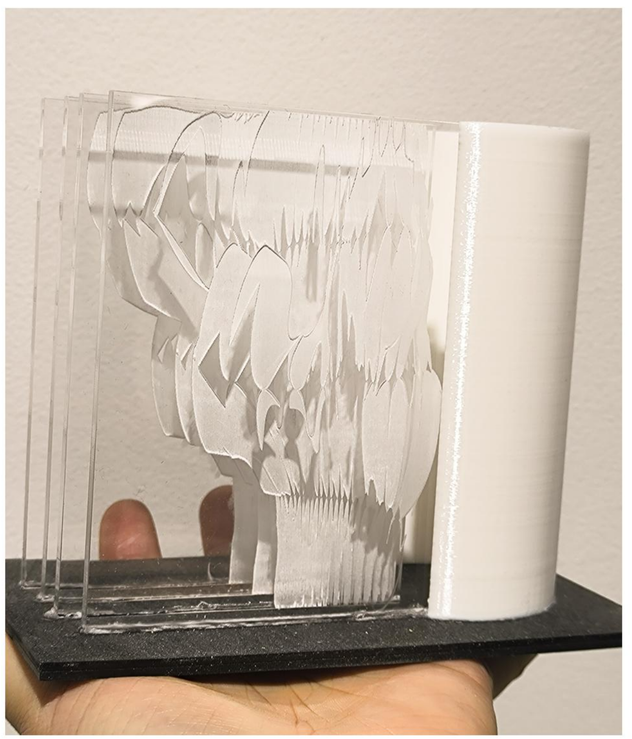


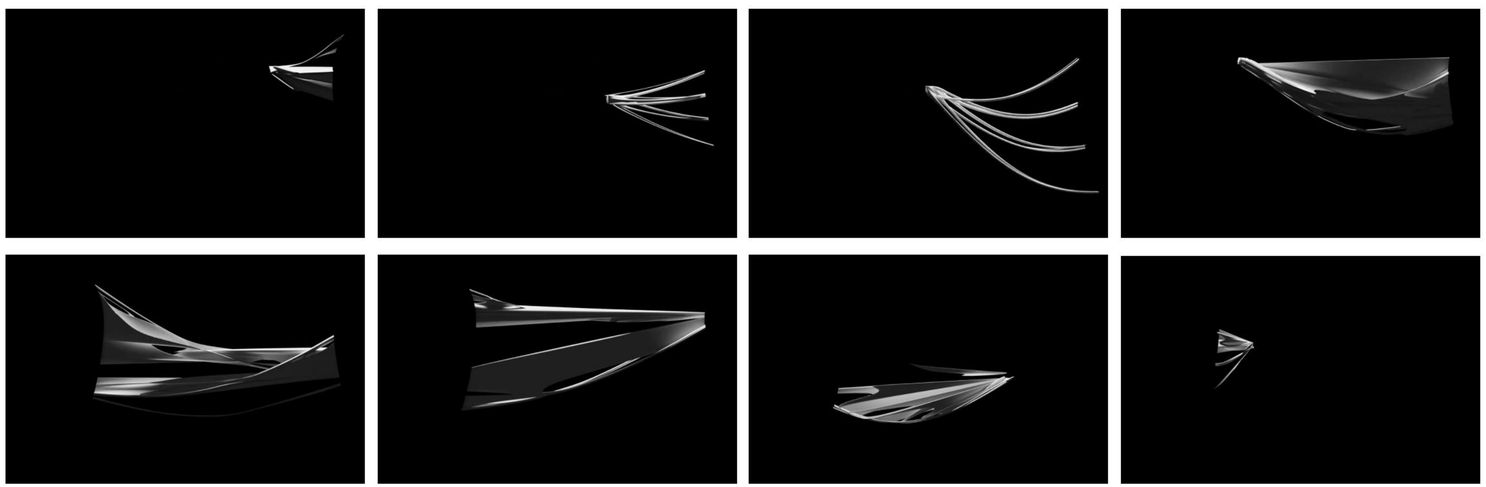












I plan to present a more complete preliminary sample at the WIP show. I created a piece of virtual content in Blender that depicts two containers tentatively interacting and adhering to one another. In this sample, I positioned the lighting in the rear half of the box to illuminate the contours of the two containers, softening the transition between the projection and the edges of the real objects.
Through testing, I discovered that if the light strip is too bright, it diminishes the clarity of the projection, making it less distinct. On the other hand, if the light is too dim, the edges of the containers appear insufficiently illuminated, leaving the projection's edges overly prominent. Tests revealed that a brightness level of 2300lm produced the best results.

Form Research

Tony Cragg

Moran Trabelsi

David Spriggs

Luby

Claire Morgan

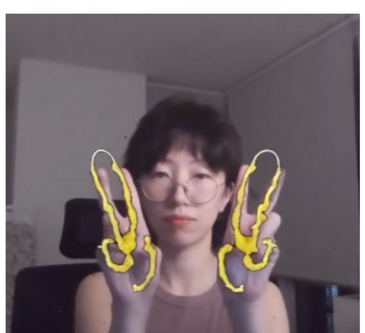
Micheal Boroniec

Simbolic vessels

Wu Ruohong

I referred to works by other artists that explore container distortions and researched their methods of representing chaos.

NicchZ

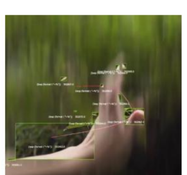


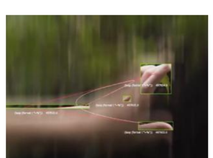
The Poet Engineer

I further explored the concepts of identity and distortion, referencing interactive art pieces by various artists and studying related interactive programming. During this process, I came across StreamDiffusion, a plugin that integrates AI-based text-to-image generation into TouchDesigner. It allows real-time image creation based on prompts triggered by gestures or other interactive behaviors.

steina vasulka—Warp

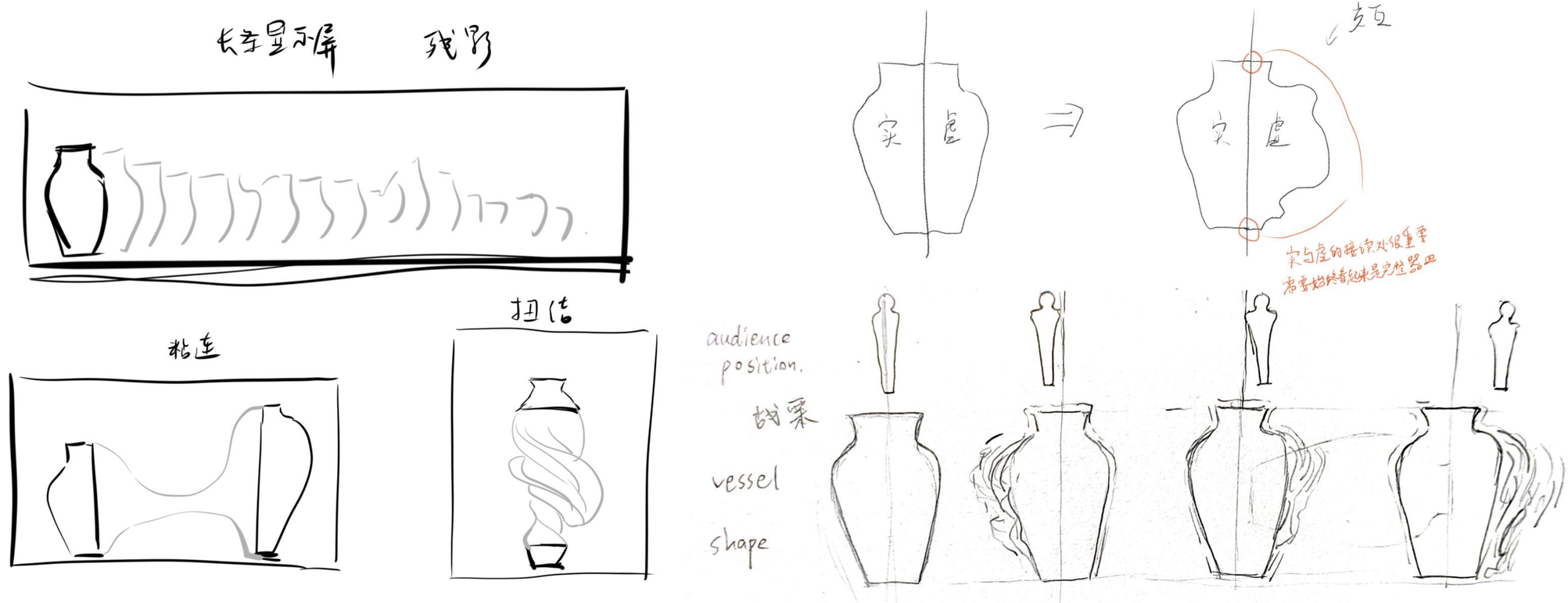
Gareth-Neal



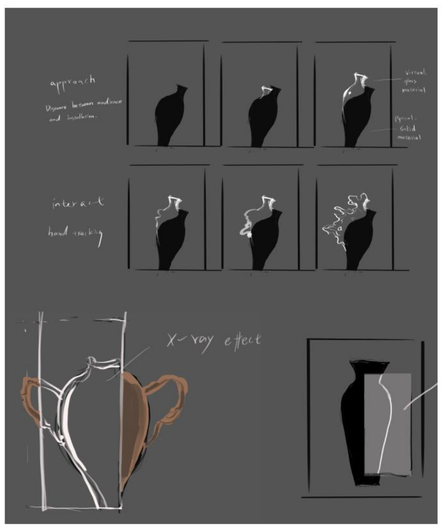


Kou Yamamoto / nouseskou

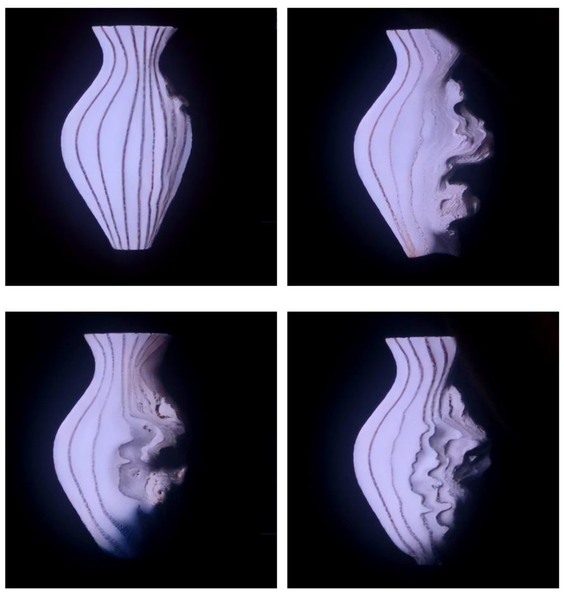
I researched some videos created using time-lapse photography, which I found fascinating. Some of the continuous and distorted imagery reminded me of Gareth Neal's series of works, which embody continuity in space and time. Building on this, I further connected the concept of the container to that of the human, realizing that containers can serve as abstractions or metaphors for humans on many levels.

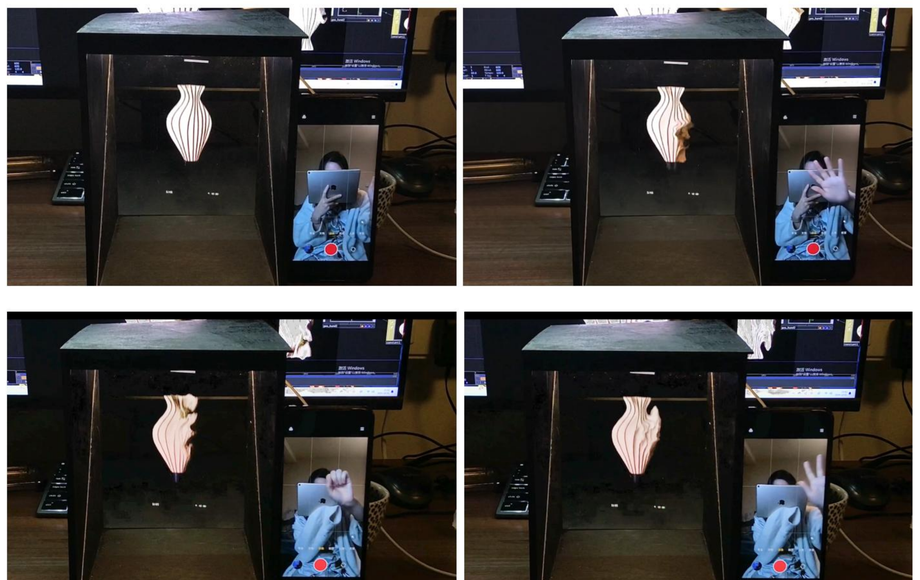


Building on this idea, I created several sketches. At this stage, I am still exploring how to represent the chaos of self-awareness and the escape from formal rules (cybernetics). Additionally, I have started to consider possible forms of interaction.

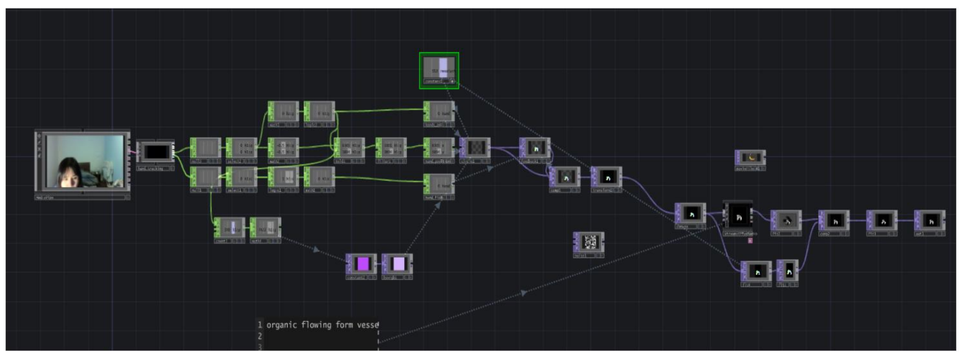


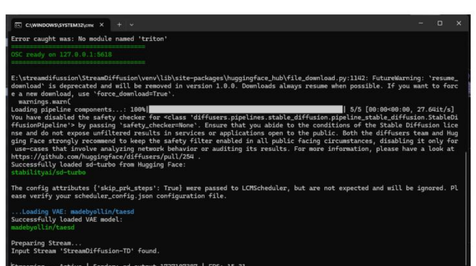
Based on the experience from the WIP show, I observed that projections tend to appear brighter than physical objects, making it necessary to use clever techniques to seamlessly integrate virtual and physical elements. Through material research and observation, I considered using virtual components with shiny edges, as this aligns well with the high brightness characteristic of projections.

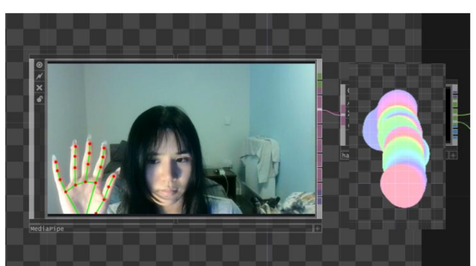


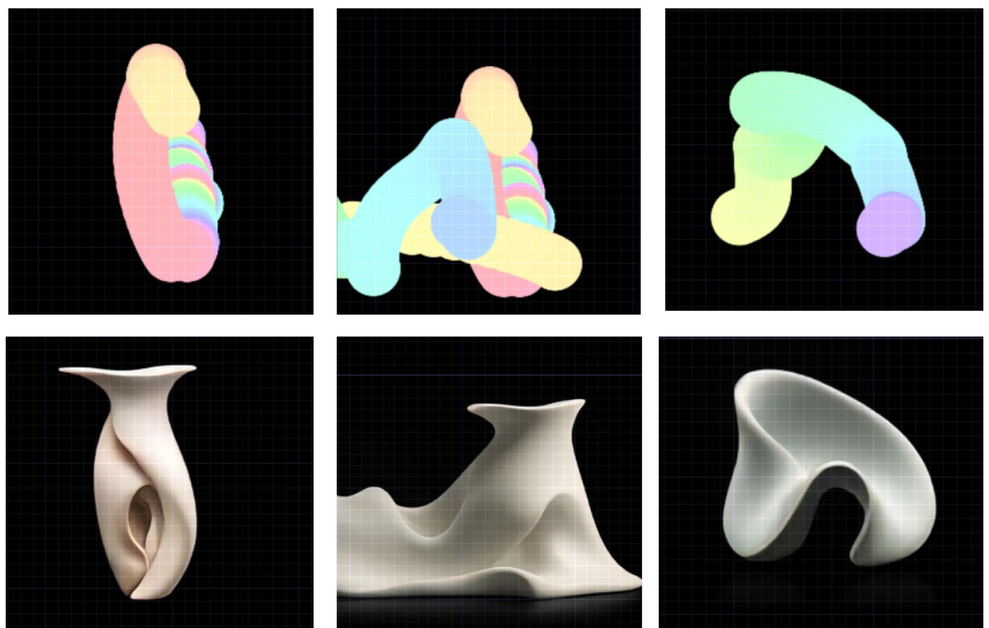


I designed some potential interaction mechanisms and explored abstract representations of chaos. I began experimenting with training AI models to generate effects resembling noise and chaos. Then, I used a smartphone as an external display for my computer, connecting it to a Pepper's Ghost display box. This setup resulted in an interactive holographic projection container.
However, during this experiment, I encountered an issue: the reflective material I used, acrylic, has a certain thickness, which caused double-layer projections that were misaligned with each other. To address this, I need to find a material that is very thin (to minimize the double-layer projection effect), rigid (to prevent image distortion), and has a high reflectivity.







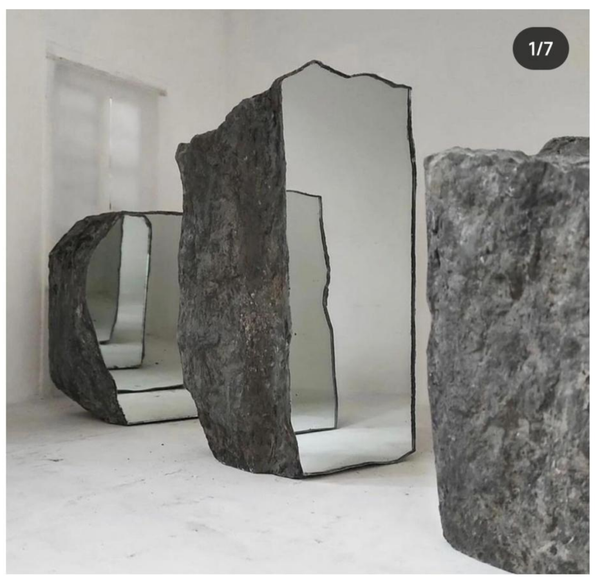


TouchDesigner is a software platform designed for creating new media art. Within it, I developed a program capable of recognizing the skeletal points and movement trajectories of the viewer's hand. These trajectories are then transmitted to Stable Diffusion, an AI model that generates images based on text prompts. Using the interactive data, Stable Diffusion creates various organic forms of containers.

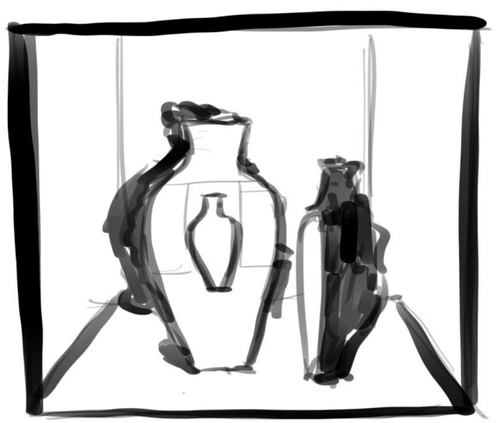
Form Design

David Nash

I spent a long time contemplating how to present my ideas or communicate them with the audience. When I came across David Nash's works, I realized that mirrors are a powerful symbol, inherently tied to self-reflection and self-exploration. In particular, in David's work, he uses standard geometric forms as metaphors for humanity and presents a more abstract, fluid subject beyond the confines of standard forms through the context of portraiture/mirrors. I found a strong connection between this approach and the themes of my project.



Daniele Arosio



I began contemplating how to incorporate mirrors into my scene and exploring suitable forms to represent self-reflection.



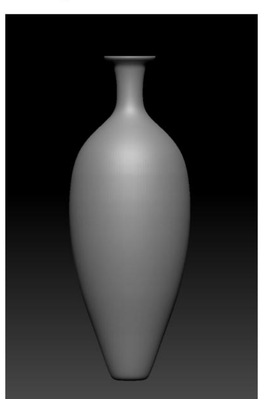


At this point, I finalized the concept of using mirrors as the central form for my first project and began designing the scene in Blender.
Initially, my idea was to depict a fully-formed container (a physical object) gazing into a mirror. Inside the mirror, a rotating platform with unformed clay (virtual content created via the Pepper's Ghost technique) would respond to the audience's hand gestures, with AI generating the shape of the clay in real-time (mimicking the process of pottery-making). Through this, I intended to express the idea of revisiting one's childhood and reflecting on the alternate possibilities that might have existed during one's growth—a key part of the search for identity.
However, I soon realized that the presence of the rotating platform felt out of place. Since it existed only within the mirror and lacked a counterpart in the real world, it weakened the mirror's conceptual role and might confuse the audience. Therefore, I revisited David Nash's approach and reimagined the mirror as a more abstract, portrait-like form, which I believe adds a metaphysical and philosophical layer to the concept.
In addition to the mirror's content, I also iterated on the design of the container. To enhance its humanoid characteristics and strengthen the context of "self-observation," I redesigned the container to have a taller, more slender shape with a slightly forward-tilted neck, giving it the appearance of gazing at its reflection in the mirror.

Dunbang Dai

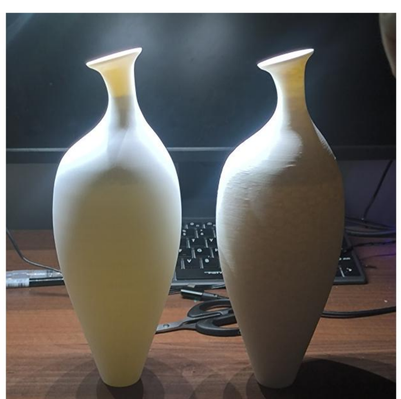
Grant Vaughan

The initial container design was a conventional jar shape. During subsequent iterations, I sought to imbue it with more human-like characteristics. For the shape, I drew inspiration from the aesthetics of traditional Chinese painting: a tall, slender humanoid form with a slightly bowed head. In the associated cultural context, such a figure often symbolizes introspection and philosophical self-examination.
Due to its narrow base and elongated shape, the model failed multiple times during 3D printing. Initially, I attempted to print the portion below the neck as solid (to ensure that the internal structure at the neck remained visible to viewers), but I found that under backlighting conditions, the container appeared semi-transparent, revealing its internal structure.
After several adjustments to the wall thickness, the printing was finally successful. I then used sandpaper to remove the surface layer's print lines, achieving a smooth, matte finish.

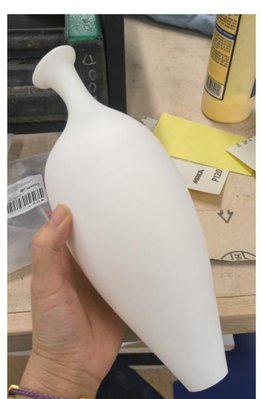


model 1

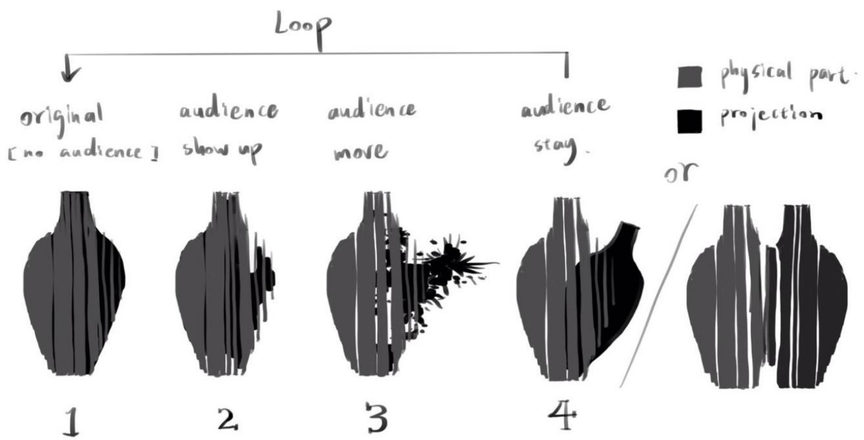
model 2



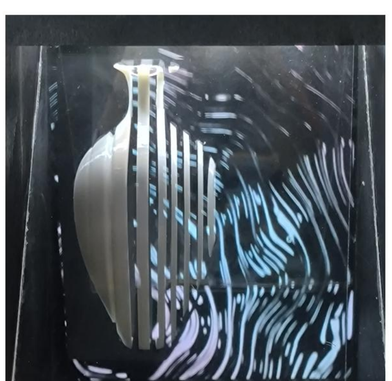
The translucency effect of the sample

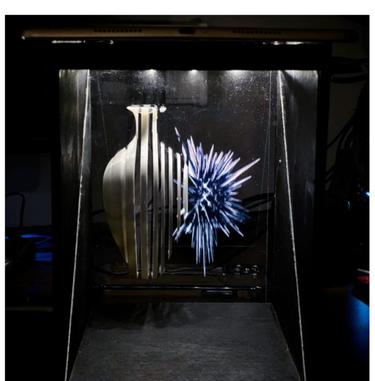


Sand off the layer lines

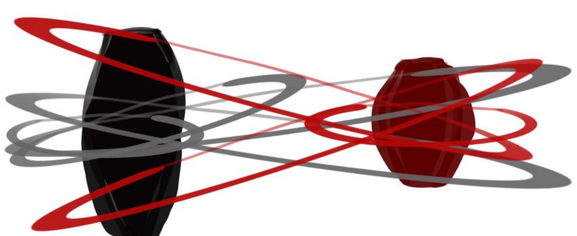


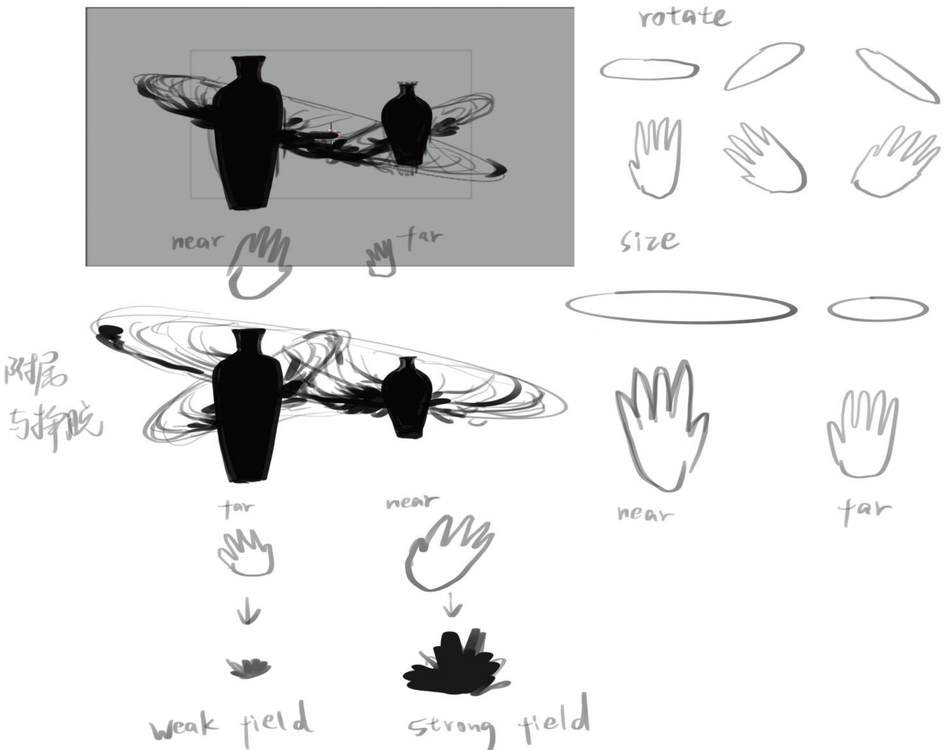
The first project primarily focuses on self-exploration, while the second project delves into social relationships. We often start with a predefined form as the foundation of our growth, then gradually discover ourselves and attempt to break free from that form.
Initially, my idea was to create an incomplete container (physical content) with a chaotic mass (virtual content) vaguely visible inside, seemingly trying to escape, eventually transforming into a new container. I conducted several experiments and attempts based on this concept, but the results did not meet my expectations.





Jeanne Bonnefoy Mercuriali





I further reflected on the dynamic of being born into a form and attempting to break free from it, and I realized that what fascinates me most is the subtle shifts in the power structures between the two entities—a dynamic that exists in almost every relationship. I used the gravitational and orbital relationships between planets as a metaphor. The key aspect of this idea is that the planetary rings are virtual content, with their size controlled by the audience. When one vase exerts a stronger gravitational pull, the other becomes its satellite or subordinate, reflecting the shifting dynamics of power. However, the rotation angles of the rings are restricted—no matter how power shifts, they always remain within each other's orbit.

Michelle Currie

Antony Gormley

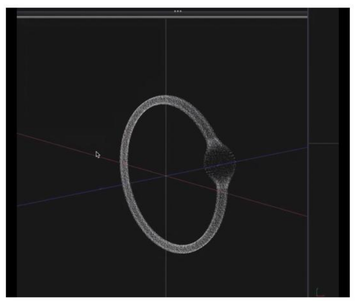
Quirin Krumbholz

Nawa Kohei

Philippa Duatz

Monika Grzymala

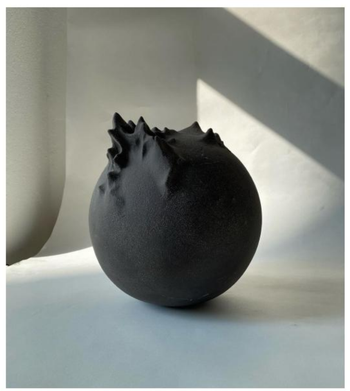
Initially, I attempted to use magnetic fields to represent social relationships, as they involve complex interactions where the distribution of forces depends on all elements within the field. I envisioned using ferrofluid or magnetic field lines to depict the planetary rings.



Initially, my idea was to gather magnetic field-related formulas and deploy a simulation of the force field in TouchDesigner. The goal was to create two interactive rings that could respond to the audience's hand movements while displaying magnetic field lines or ferrofluid-like effects. However, after further research, I realized that the computational complexity involved was too high, making it difficult to implement.

I then experimented with filling a circular ring using a particle system. When a point (a magnetic attraction point) approached, the particles dispersed, creating corresponding distortion effects.
Next, I added noise to the particle system, making the dispersion patterns more random and dynamic.
Additionally, I experimented with using the vector fields of the ring's geometric topology (where each face's vector is its normal direction). When the magnetic point approached, spiky deformations appeared within the affected area of the ring, with the face normals being altered. Adding noise made the effect more natural, and the distance between the magnetic point and the ring inversely affected the size of the spikes.
However, due to the complexity of magnetic forces, accurately simulating them in the software proved challenging. As a result, the samples often failed to achieve realistic or convincing effects.

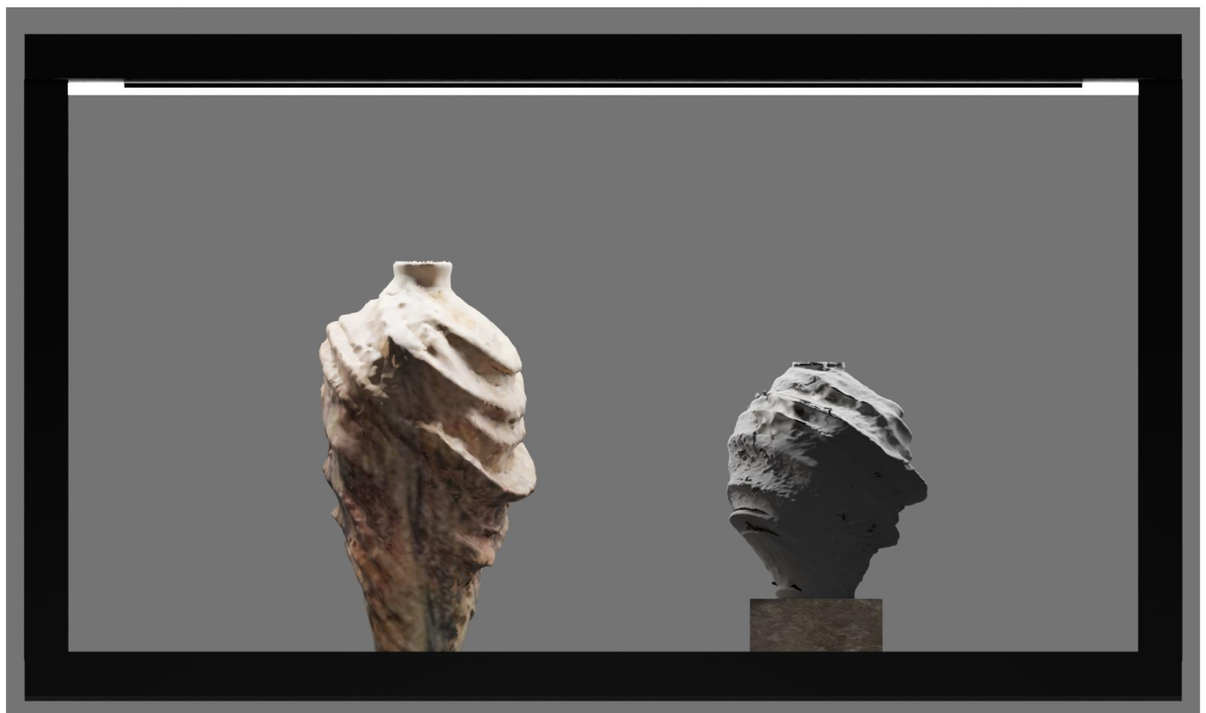
Insdim Official



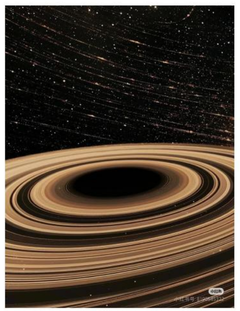
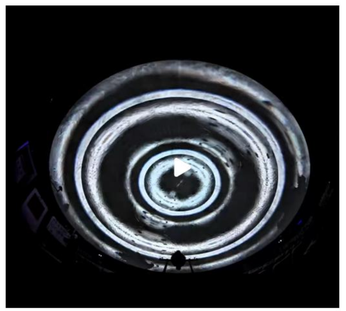
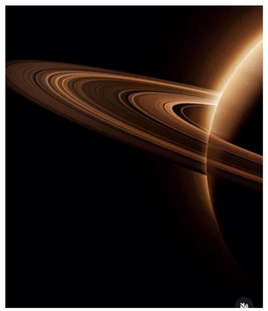
Latika Nehra

Viktor Tabis

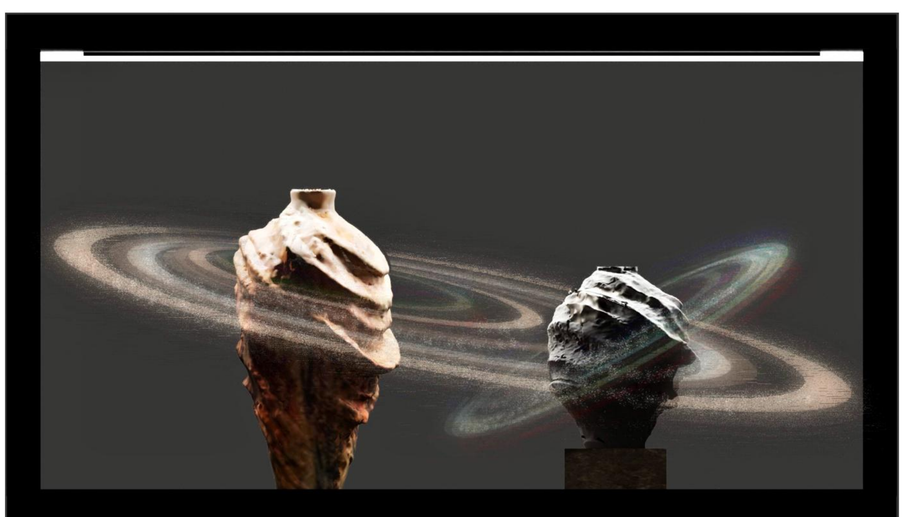
Boon Room

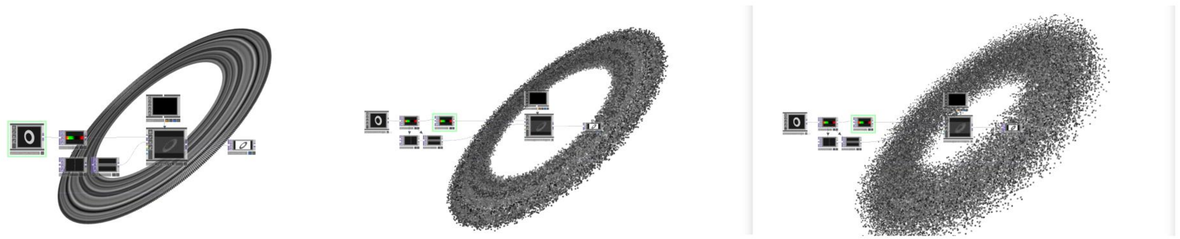


Subsequently, I aimed to reinforce the planetary concept by redesigning the vase with a more rotational aesthetic, as this would more easily evoke the imagery of a celestial body's rotation. I chose a rocky texture for the vase to further emphasize this connection to planetary forms.

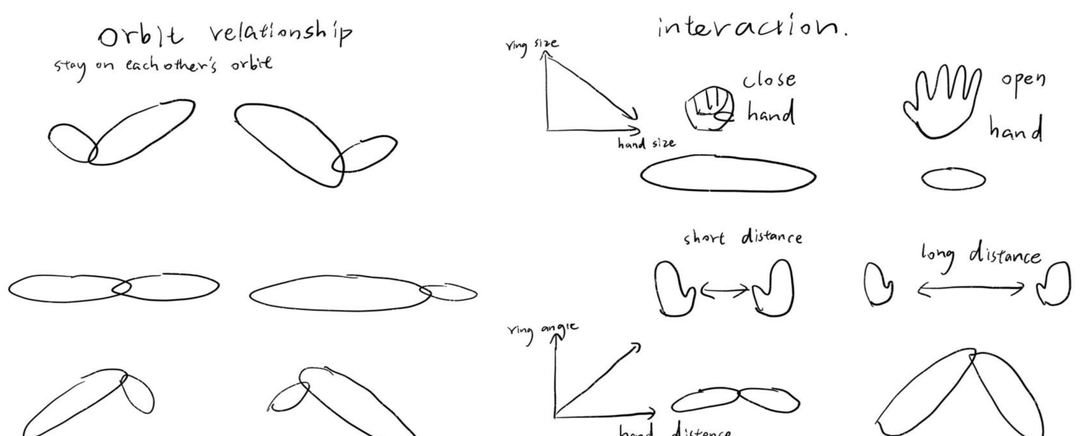




NASA

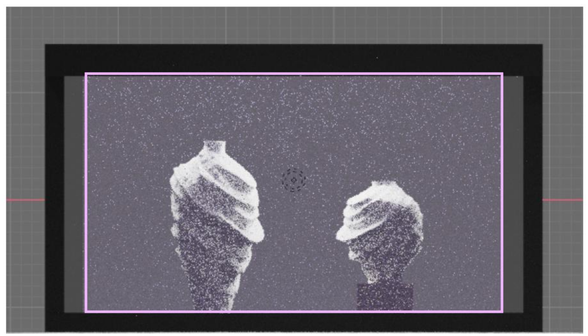




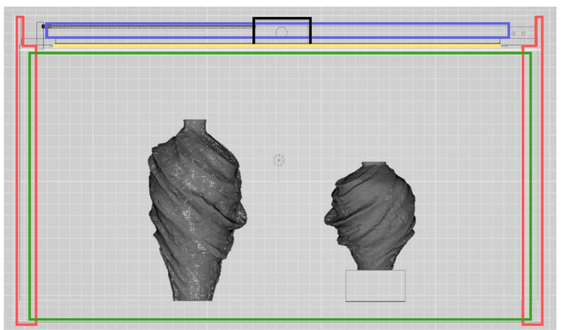
For the ring portion, I attempted to simulate Saturn's rings, and this part is still in progress. I aim for the rings to have a particle dispersion effect during motion.
Here is an initial demonstration of the interactive rings, but there are many details yet to be refined. Ultimately, the rings will correspond to the viewer's left and right hands, responding with appropriate rotation and scaling based on their movements.



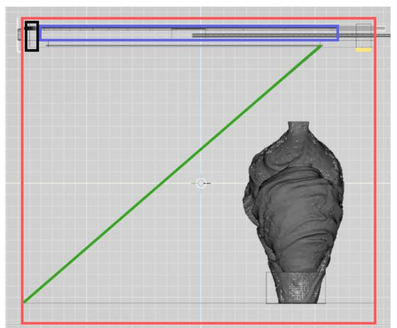
Structure Design



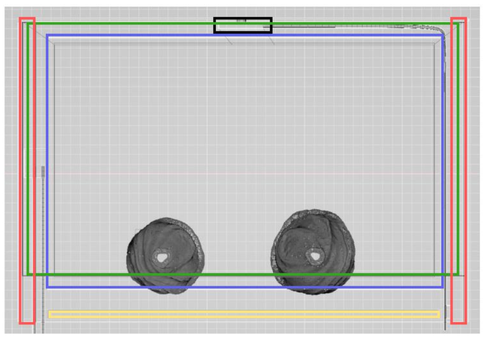
：The projection range corresponding to the screen.



：camera



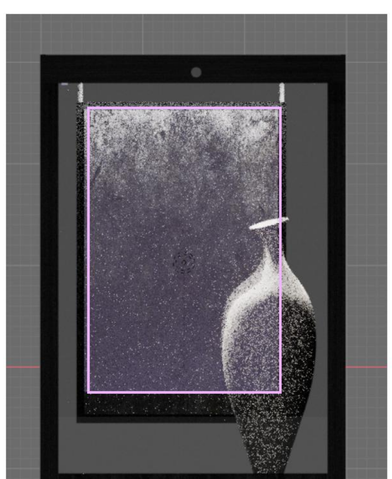
：reflection panel

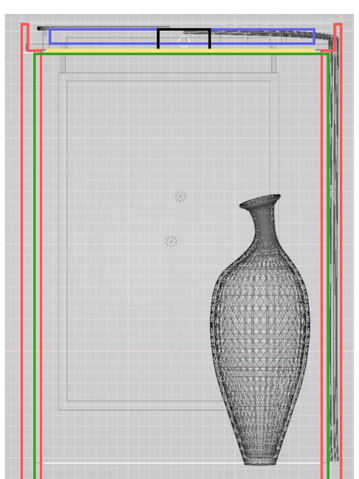


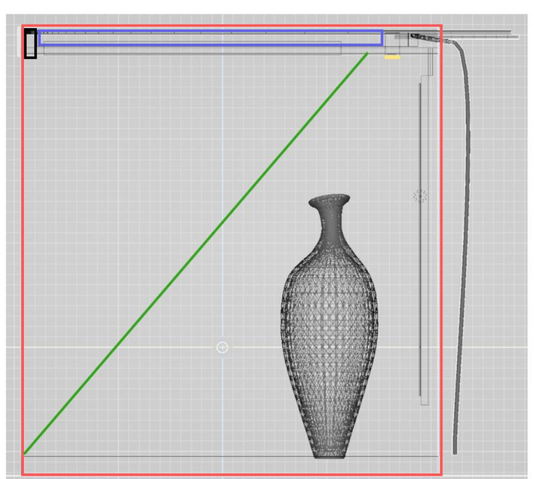
：monitor

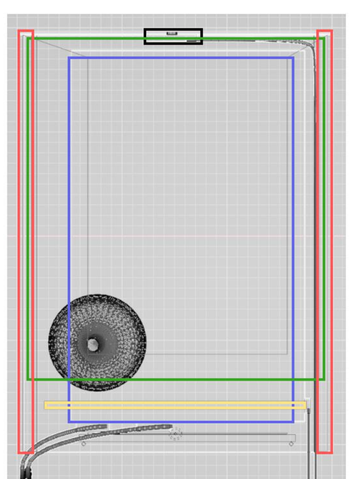
：LED strip

：side panels

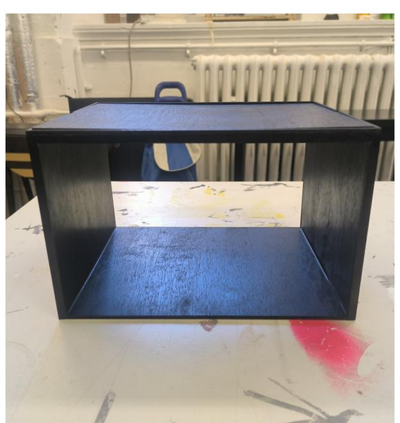




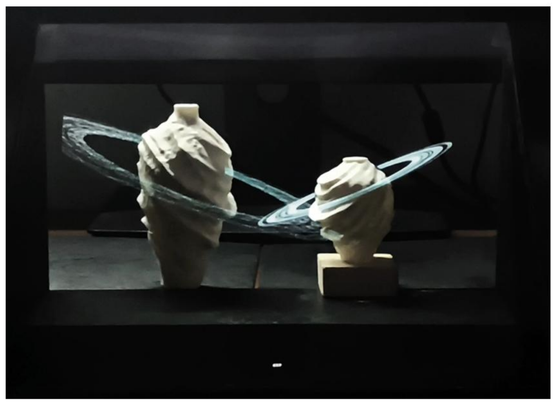


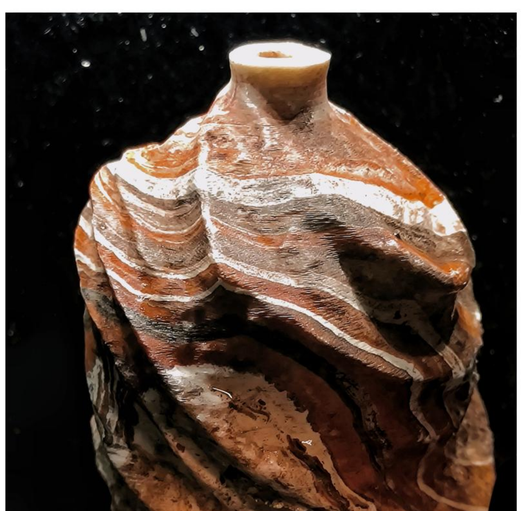


Prototype



I created a half-scale sample box to test and adjust the positioning for both projects.
During testing, I found that in the Satellite project, the occlusion relationship between the rings and the container is a critical factor for effective presentation. If they don't align well, the overall effect lacks coherence and persuasiveness. To address this, I imported the container model into the interactive program and positioned it in the same place as in the physical demonstration, ensuring better integration between the virtual content (rings) and the physical object (container).
In the Mirror project, the virtual content must align precisely with the mirrored area, and its size should be proportionate. I made corresponding adjustments in the program to ensure the virtual elements fit seamlessly with the mirror's display area.





I began exploring how to simulate a realistic and convincing planetary texture, which led me to learn about water marbling (hydrographic printing). This technique involves increasing the surface tension of a liquid (by adding a thickening agent) so that paint can remain on the liquid's surface and spread evenly. Various techniques are then used to create marble-like patterns, which are transferred onto objects by immersing them in the liquid.

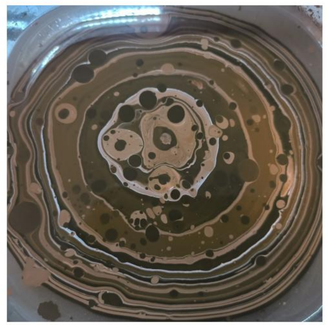
Using paper clay, I crafted some samples with planetary surface structures and conducted water marbling experiments. The initial results were unsatisfactory, as the paint struggled to adhere to the sample's surface, often flowing off along with the hydrographic solution. After multiple tests, I found that this was due to the overly smooth surface, which lacked sufficient adhesion.

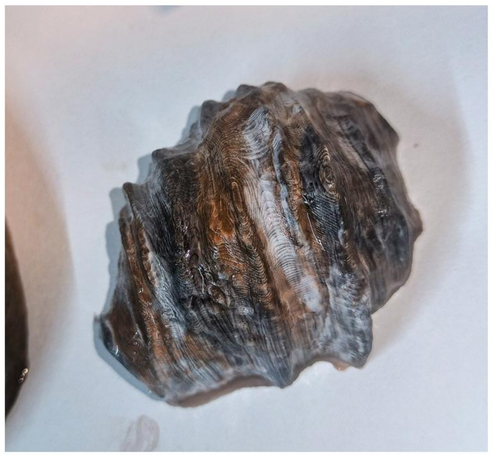
Additionally, testing on 3D-printed objects revealed that the layer lines of PLA act as channels, causing the paint to flow along the fine grooves, which further hindered color retention.

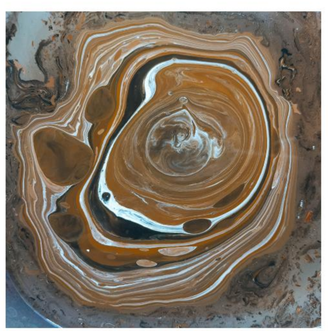
Through research, I decided to apply gesso (a primer commonly used in painting that creates a textured surface with fine particles to improve adhesion) to the sample's surface. This significantly improved the quality of the water marbling transfer.

Based on these findings and considering that my final piece will be made of 3D-printed PLA, I proposed the following process:

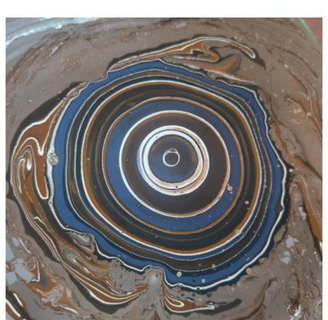
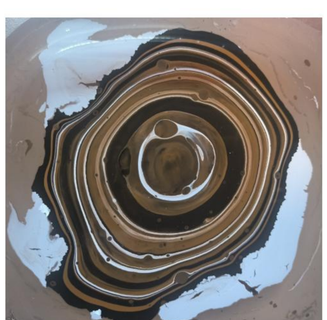
1. Sand the PLA surface to reduce the interference from layer lines and increase adhesion.
2. Apply an acrylic base coat for an even foundation.
3. Coat the surface with transparent gesso to create a smooth yet textured base for better paint adherence.
4. Perform the water marbling process to transfer the pattern onto the object.









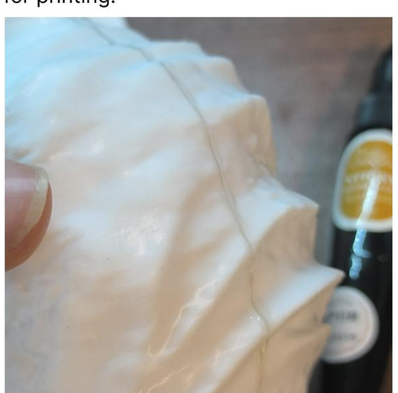



To create a distinction in color, the left container leans toward earthy tones, resembling Saturn, while I incorporated some blue into the right container. This creates a subtle contrast between warm and cool tones on either side.

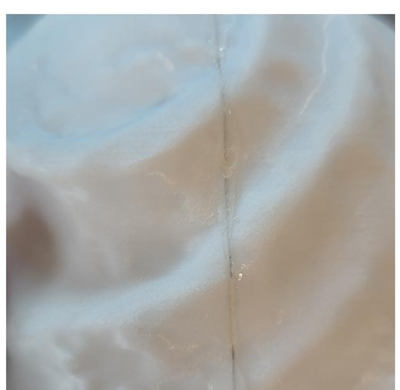
Making Process

To facilitate the removal of internal supports, the model was divided into two parts for printing.

Sanding to remove layer lines (comparison of before and after sanding shown on the left and right).



Assemble the model, then use UV glue to bond the pieces together and fill in the seams.



Sand the seams to create a smooth, seamless finish.

Apply a base coat using acrylic paint.

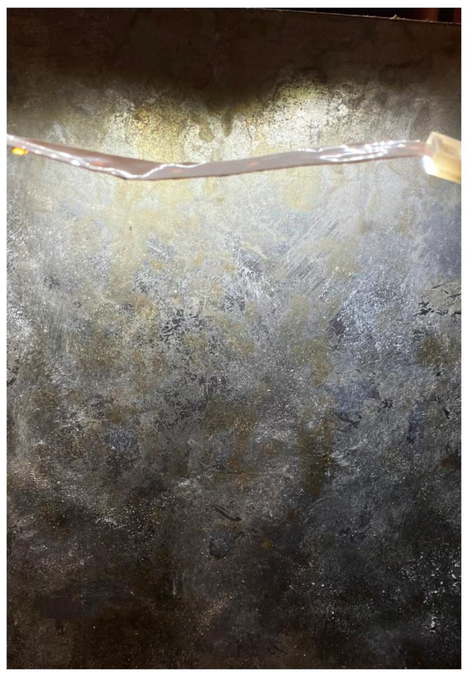
Apply a layer of transparent gesso.

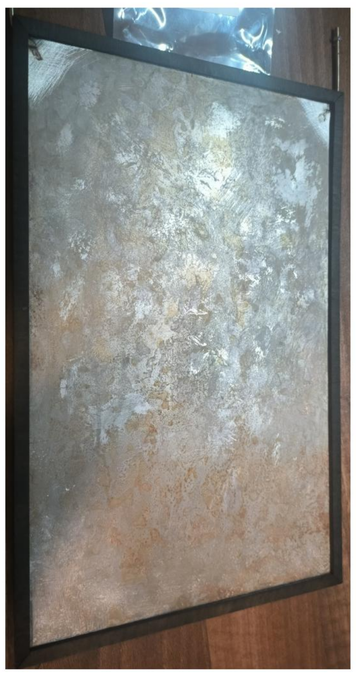


After the gesso dries, perform multiple water marbling transfers on the model as needed. After each layer of paint dries, apply a thin coat of gesso to enhance adhesion and fix the colors.

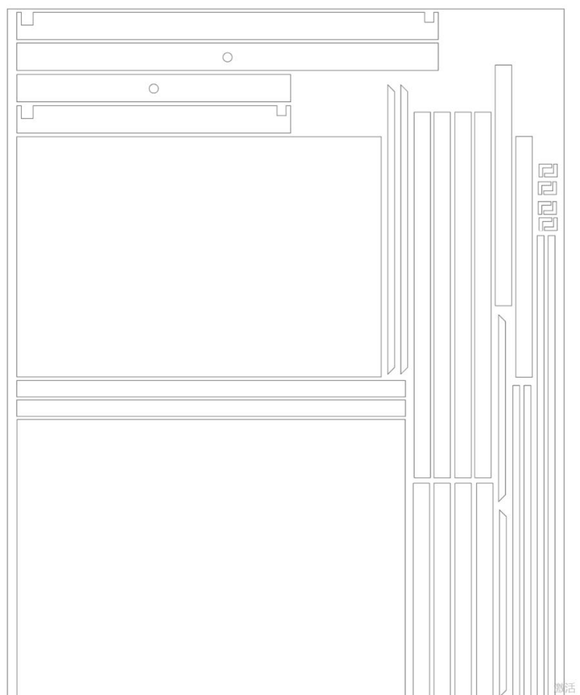

Next, use acrylic paint and watercolor for manual touch-ups, ensuring the texture aligns more naturally with the container's structure.

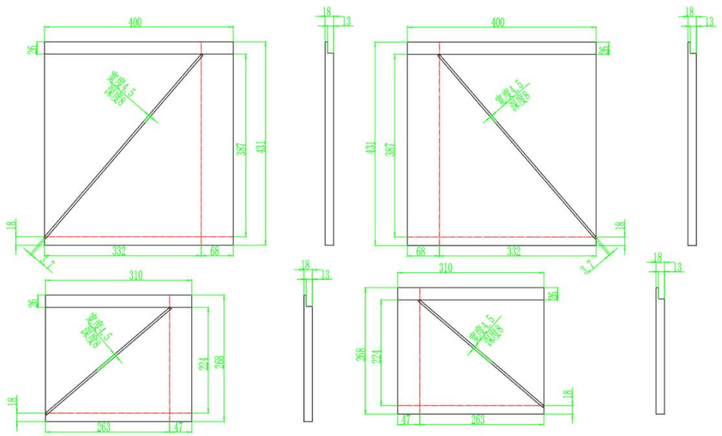


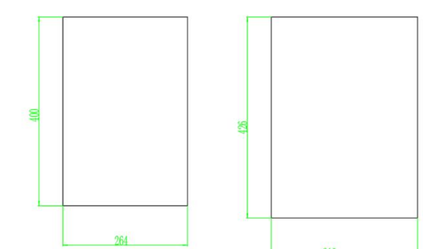


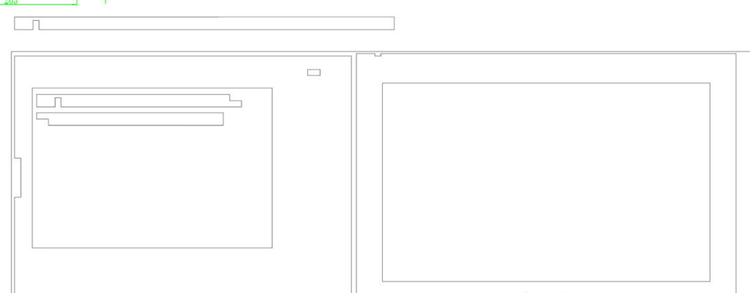


To simultaneously convey the concepts of a mirror and a portrait, I used a rusted mirror as a reference, where the image appears faint and abstract.
The material I chose was mild steel. After researching techniques, I combined different types of vinegar (Chinese white rice vinegar, Chinese aged vinegar, Italian balsamic vinegar, and apple cider vinegar) to create varying degrees of rust. This process involved alternating between sanding, corroding, and applying small amounts of texture paste.
Under lighting conditions equivalent to those of the final display, I tested and adjusted the effects to ensure that the center of the mirror (where the virtual content would appear) remained relatively smooth, allowing it to reflect the black base of the display box and emphasize the virtual content. Meanwhile, the edges were made rougher to enhance the aged texture. Finally, I added a black wooden frame to the mirror.





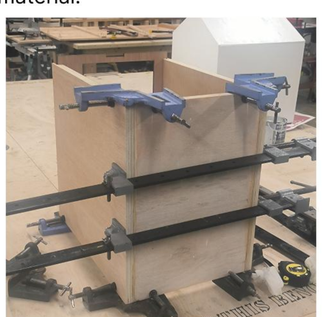




For the final product, I drafted the CNC design. The left, right, and bottom panels are made from 18mm plywood, the shelf for the screen is 5.6mm plywood, and the top cover and the front and back blocking panels are made from 3.6mm plywood.
To allow the reflective panel to be inserted, the initial plan was to create grooves on the left and right sides with a depth of 8mm and a width matching the thickness of the reflective panel (approximately 1mm). However, after consulting with technicians, I learned that a 1mm-width tool can only cut to a depth of 4mm, which might not be sufficient to secure the reflective panel.
I revised the plan to grooves with a depth of 8mm and a width of 4.5mm. Into these grooves, I will insert a 3.5mm-thick and 8mm-wide strip of material, leaving a 1mm x 8mm slot to securely hold the reflective panel.



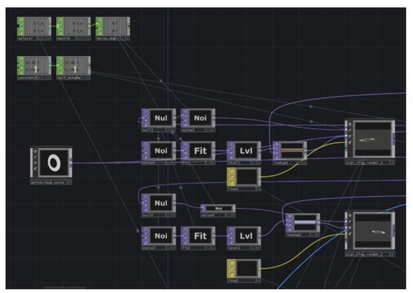
Since recycled wood was used, I first sanded off the surface's old adhesives and paint. Then, I applied wood stain to recolor the material.

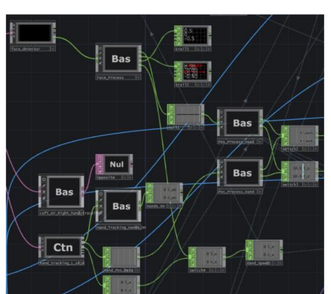

Next, the wooden panels were bonded together, with clamps used to provide additional reinforcement during the process.


Finally, wax was applied in three layers, with the surface polished after each application.

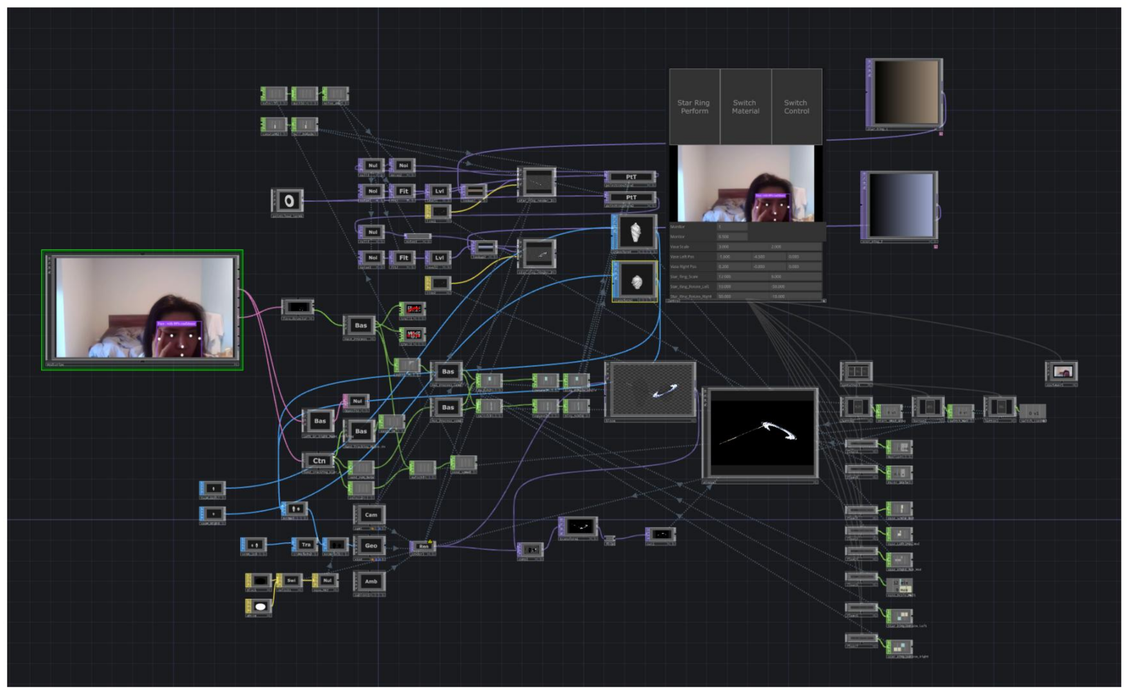
Programming

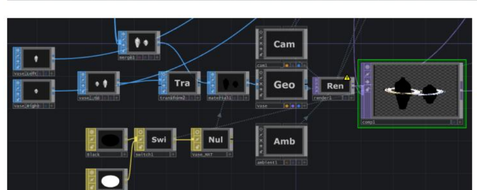


Star Rings:
Based on a circular model, gradient textures are added, and two star rings are generated using a particle system. A noise node is introduced to create a particle dispersal effect when the star rings are in motion.

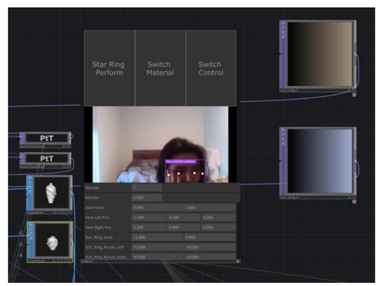


Motion Capture:
Capture the data channels corresponding to hand opening and closing as well as the distance between the two hands. The size of the rings is inversely proportional to the size of the hands, while the rotation angle of the rings is directly proportional to the distance between the hands.

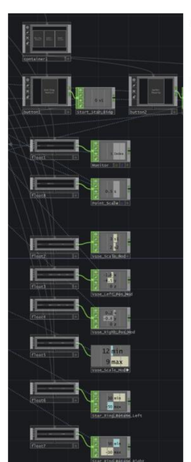




Masking Model:
Import the 3D models of the two vases and assign them a completely black material. Position them in the same location as the physical objects to effectively mask the rings.

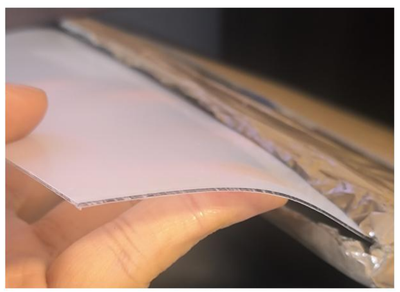


Control Panel:
Designed for quick adjustments to accommodate different on-site environments.



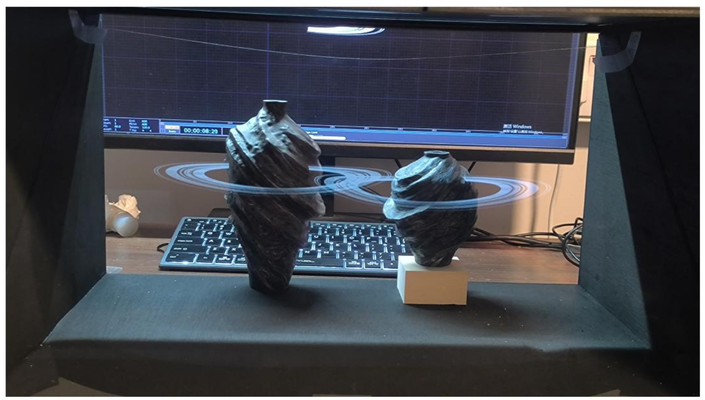
Control Panel Parameter Integration:
Integrate all key parameters, including:

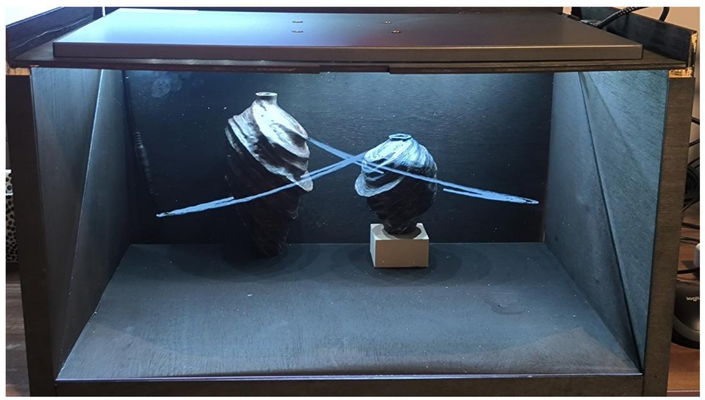
- Ring Size
- Ring Position
- Masking Model Size
- Masking Model Position
- Ring Color
- Particle Size

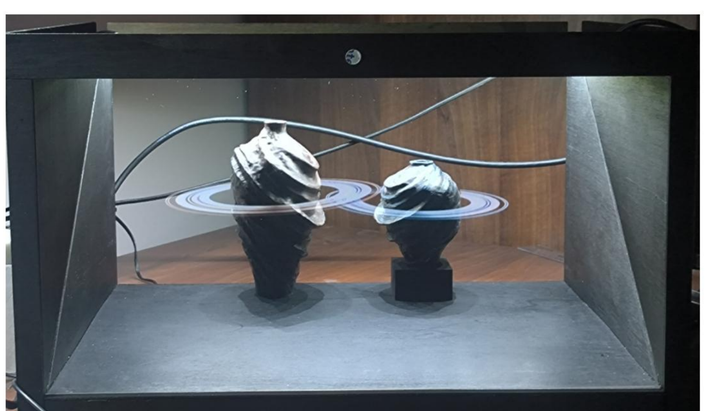


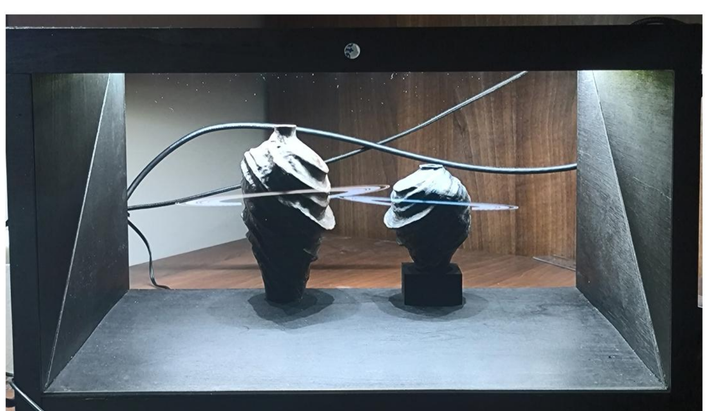
0.5mm PETG

1mm Acrylic







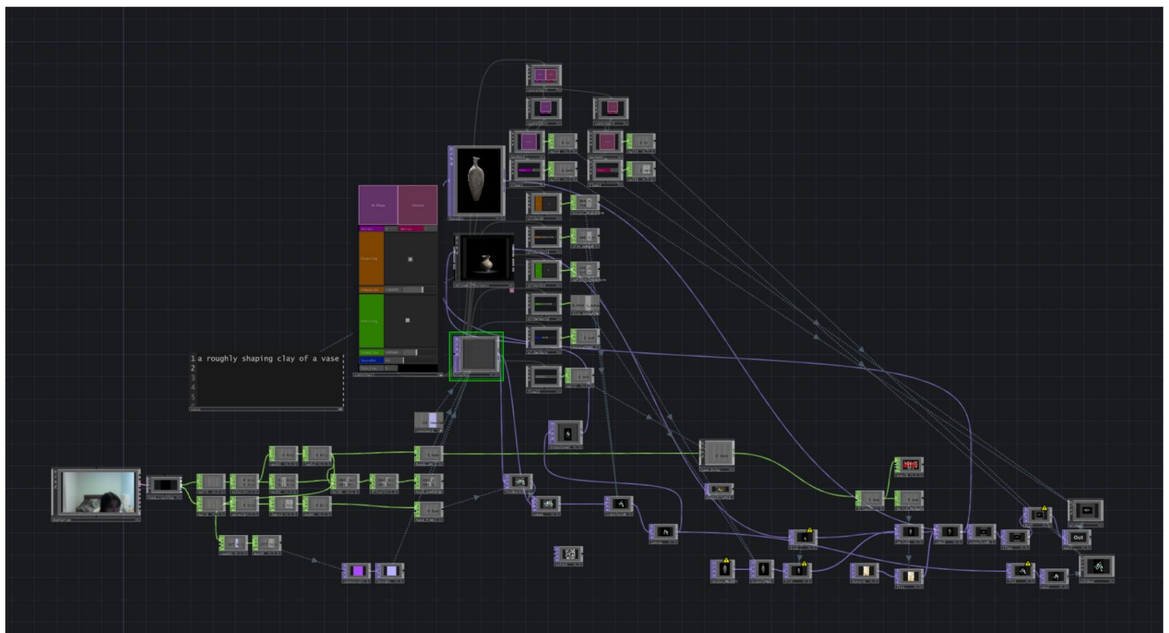


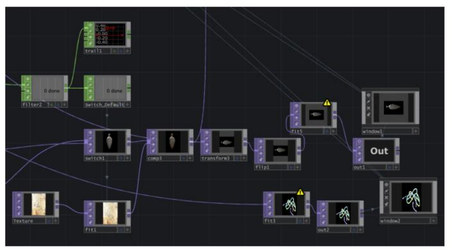
Testing in the Final Display Box: The initially selected reflective panel was 0.5mm PETG, but it proved to be too flexible, causing the image to distort. I then switched to 1mm acrylic, which resolved the issue.

Programming

Control Panel with Parameter Integration:
Integrate all key parameters to enable quick adjustments based on different on-site environments. These include:

- Default Image and AI-Generated Image Size
- Default Image and AI-Generated Image Position
- Interval Duration for Switching Between the Two
- Image Saturation and Contrast
- Line Thickness for Gesture Trajectory Tracking



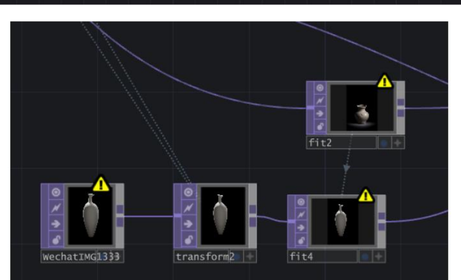


Mirror Texture Masking and Image Switching:

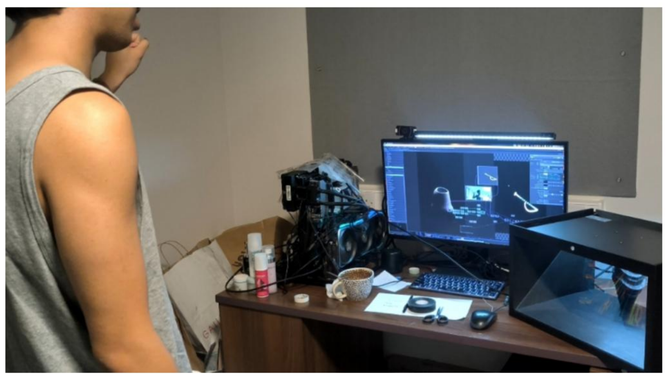
1. Texture Masking:
   - Scan the mirror texture and apply a corresponding mask to the output image, ensuring that the projection blends seamlessly with the scene.
2. Image Switching:
   - When interactive behavior is detected, a switch node replaces the default image with the output from Stable Diffusion.

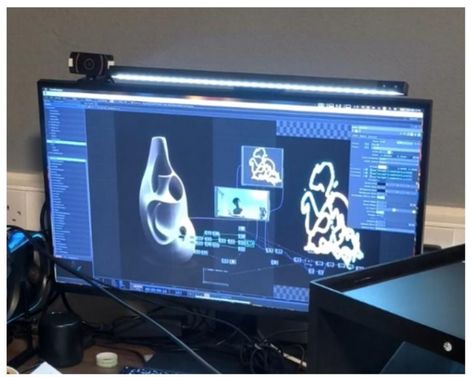
Trajectory Deformation:
Since both the physical container and the mirror are elongated rectangles, the hand gesture trajectories are stretched and adjusted in size and position to better fit the imaging area.

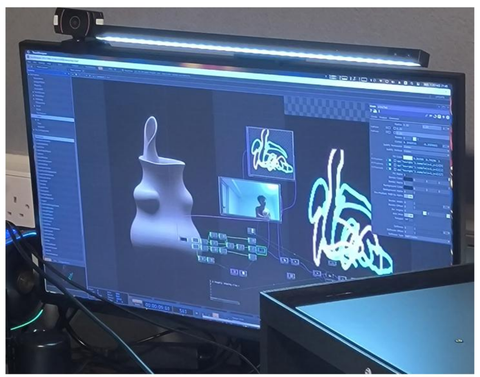
Motion Capture:
Capture the data channels corresponding to hand movement trajectories and record motion data. Assign thickness and gradient colors to the trajectory lines, which will serve as input for Stable Diffusion to generate images.

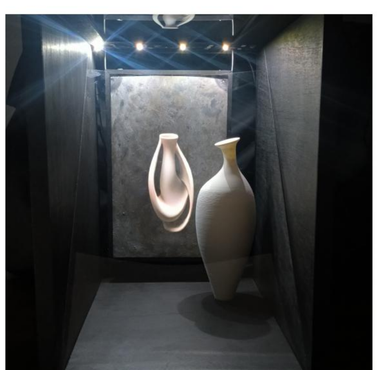


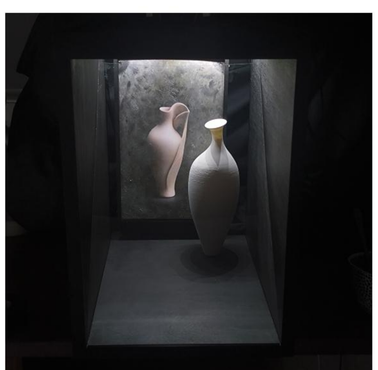
Default Image Input:
Render an image of the back side of the container (representing the container's reflection in the mirror under normal conditions) and set it as the default image when there is no interactive behavior.

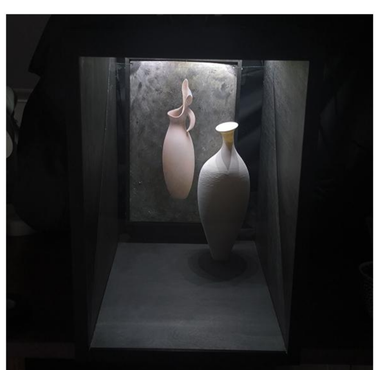




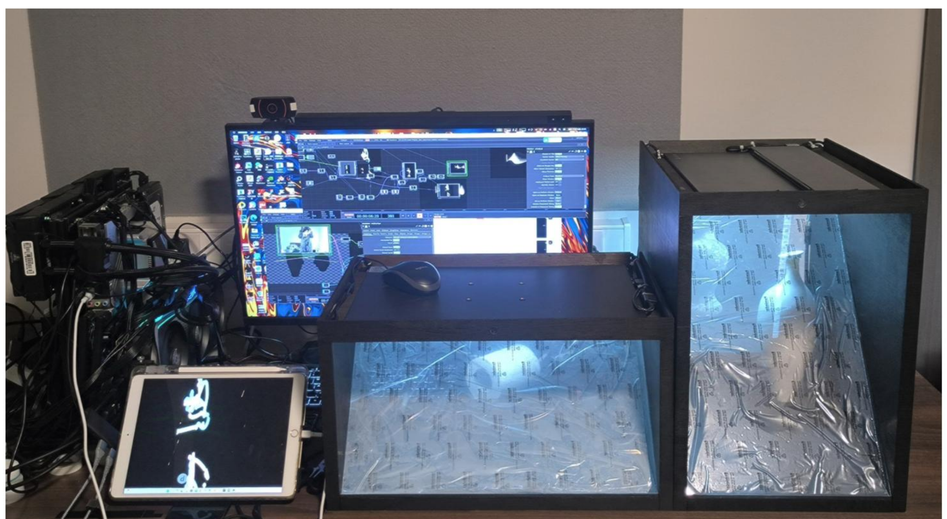
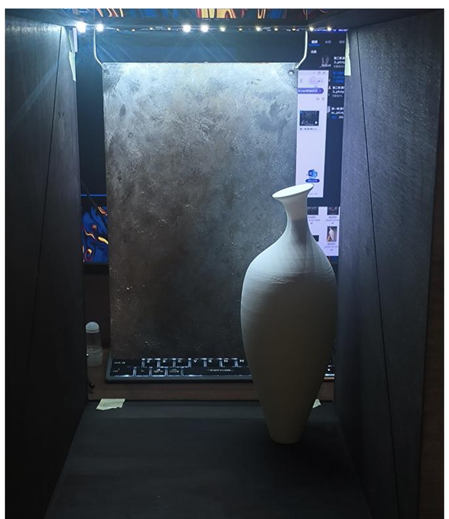
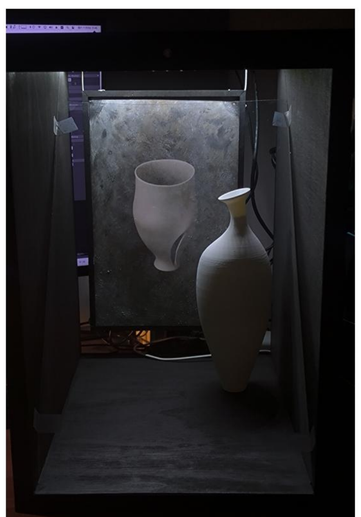
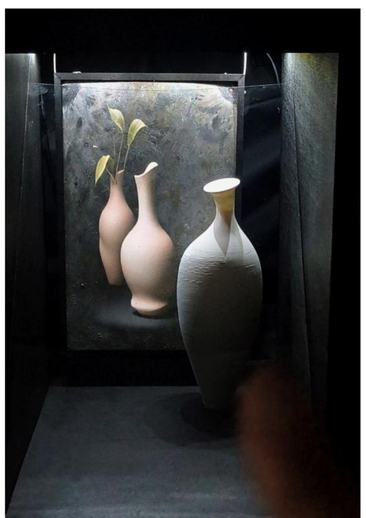






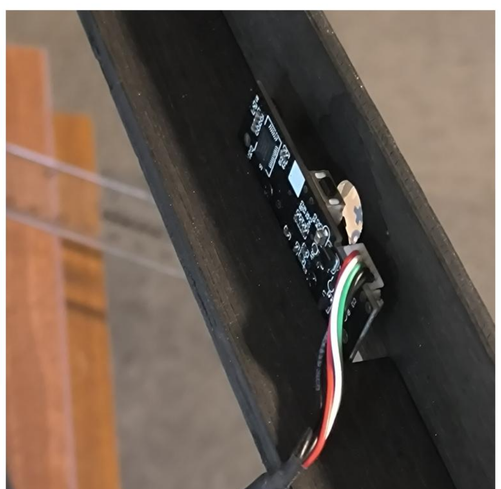


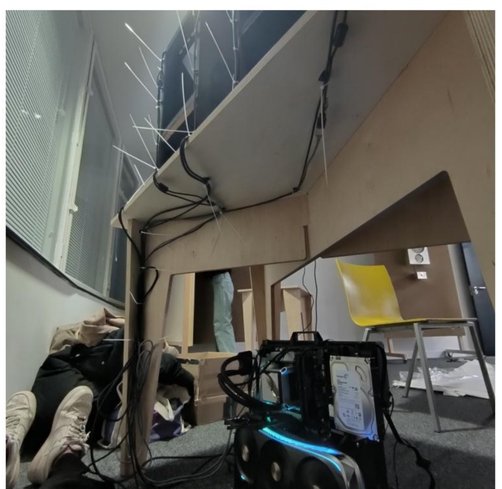
Testing Interactive Effects for the Mirror Project: Friends were invited to test the interactive effects of the Mirror project, and adjustments were made to relevant parameters. The primary parameter adjusted was the line thickness of the gesture trajectory, which is directly proportional to the level of detail in the AI-generated container.

Lighting Adjustments:
Lighting was also refined during testing. The experiment revealed that with uniform lighting from the LED strip, the mirror area became too bright, causing the virtual projection to lack prominence. To address this, selected LED bulbs near the mirror were covered, ensuring that the right-side physical container was well-illuminated, while the left-side mirror area was subtly lit, enhancing the delicate, aged texture of the mirror.

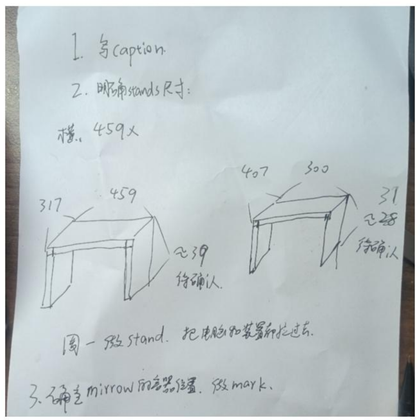
Making Process





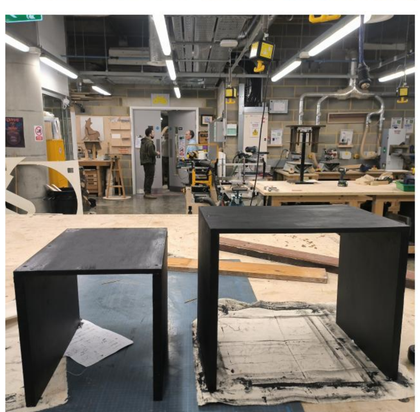
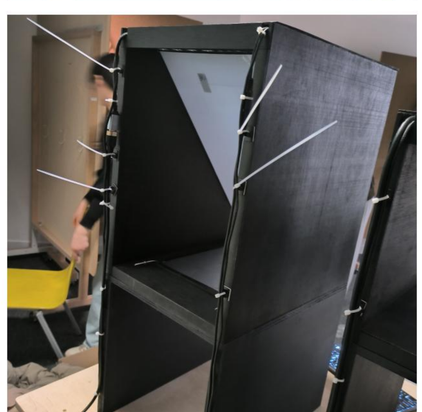
Each installation has four data cables, evenly distributed to the rear sides: the left side contains the camera data cable and the LED strip power cable, while the right side contains the HDMI cable for the display screen and the power cable. Zip ties are used to help organize the cables, which are hidden behind the side panels of the installation.

At the exhibition site, all cables are connected to 3-meter extension cords and concealed behind the back of the tabletop.

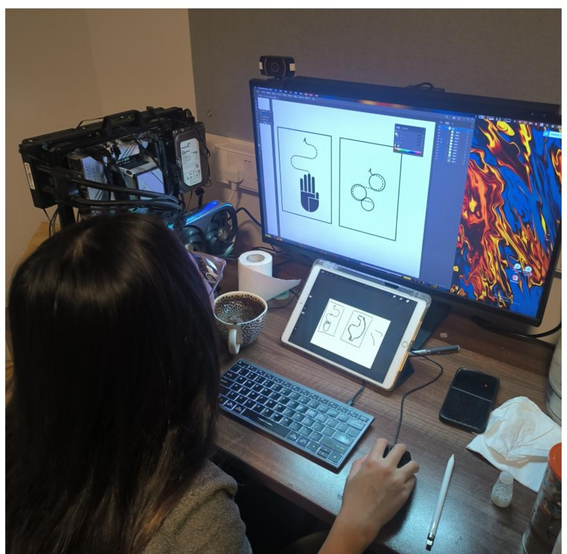




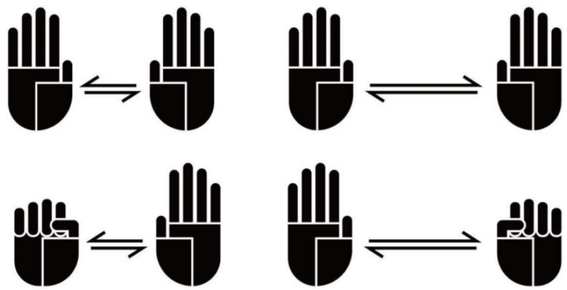


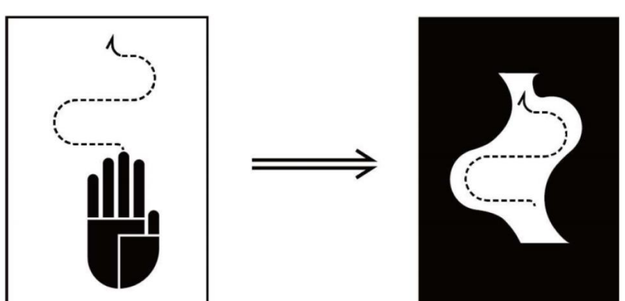
I started preparing props for the show and created a stand based on the dimensions of the tables in the exhibition venue.



Yuning helped me create the interaction captions. Many thanks to Yuning!



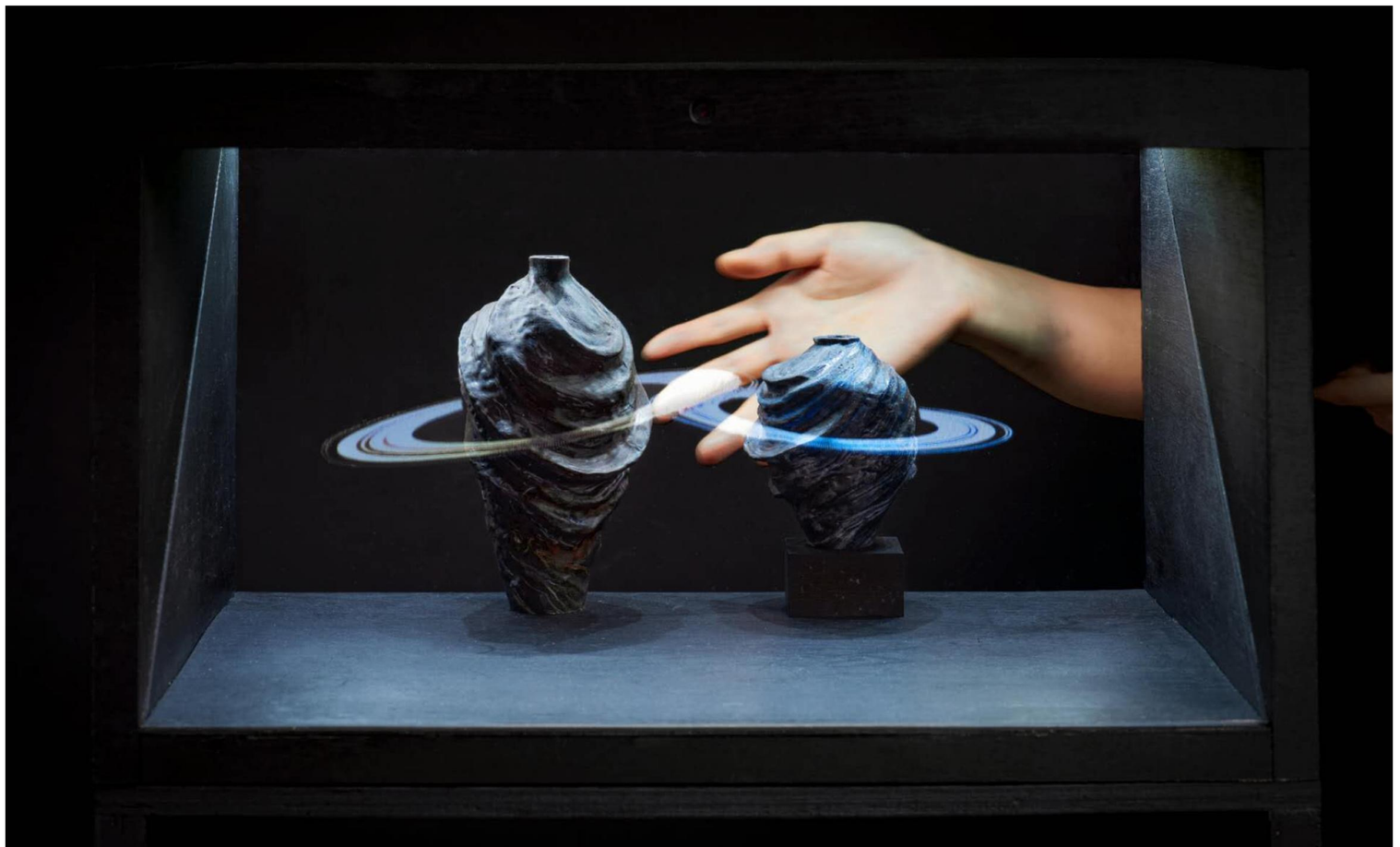
CONTROL TWO RINGS WITH HANDS, INDIVIDUALLY.



CREATE YOUR VASE WITH TRACE.

Final Piece

video link：https://www.youtube.com/watch?v=Ga1M9IpX5u0



Satellite:

We navigate a web of social relationships—be it with parents, friends, or partners—where subtle shifts in power dynamics constantly unfold. No one can remain the center of a relationship forever. Like celestial bodies, changes in gravity pull one party to the center while the other drifts as a satellite,distorting the rings and losing their orbit.
Even amidst the unease of losing control, we strive to stay within each other's paths.

video link：https://www.youtube.com/shorts/IphpzhU_iTY

Echo:

In the age of cybernetics, we are trapped in predefined social roles, struggling with a sense of identity. The vase, a familiar form, serves as a metaphor for societal rules in this work.
As viewers interact with the mirror's reflection, they step into the role of the vase. The chaos of their free will blurs the boundaries of these rules. In gazing into the mirror, they witness the echo of their own self.