

PORTFOLIO

Jiaqi Zhang ————— 2023

Tomorrow

UI & UX Design for a Mental Health App

Four Seasons Fans

AR App Development

EmoEar

Interactive Device for Emotion Monitoring

Escape

First-Person VR Game Development

Tomorrow

UI & UX Design for a Mental Health App

Duration 3 months

Year 2021

My Roles UX researcher, UI designer, illustrator

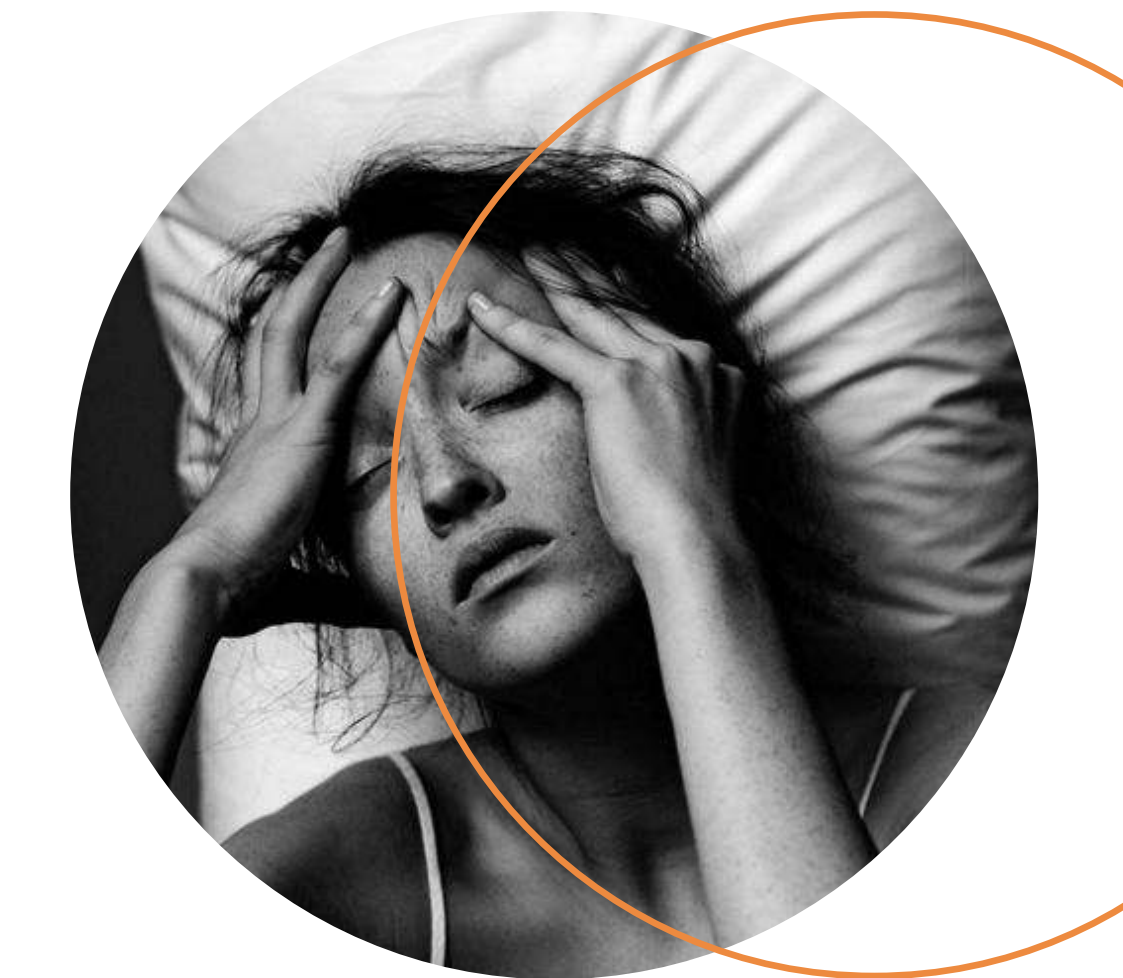
Team Members Jiaqi Zhang, Xinyue Yin, Liting Wen, Zimo Yang

PROPOSAL

The project concentrates on the topic of mental health. Our goal is to develop a progressive mental health app that helps users become more positive day by day.

“I found tomorrow is not attractive to me anymore.”

Many people today struggle with stress, anxiety, and the demands of daily life, often feeling like they're lost in a barren wilderness of their thoughts.



“What if we create an app that can cultivate inner growth?”

Introducing "Tomorrow" - your path to a healthier mind. Our app provides a daily sanctuary for your thoughts and emotions, letting you nurture your mental well-being. Write in your diary, find solace in inspirational reads, and watch as a vibrant forest of new life gradually emerges with each visit. Experience the transformation from within.



PERSONA

For UX research, I developed a persona and utilized storyboards, Customer Journey Maps (CJM), and other tools to gain a deeper understanding of our potential users.



Jun

"I feel overwhelmed by new environment."

Age 22
Occupation Intern
Location Beijing, China
Status Single

Bio

After graduating, Jun decided to remain in Beijing rather than returning to his hometown. His first professional experience came in the form of an internship at a technology company. This ambitious young man soon recognized the stark contrast between the corporate world and the academic environment.

Frustrations

- "Every day feels monotonous."
- "It is really lonely to live in a strange city, but I am afraid to make friends with my colleagues."
- "I often feel depressed and anxious but have no idea how to solve them."
- "I'm not finding fulfillment in my work."

Goals

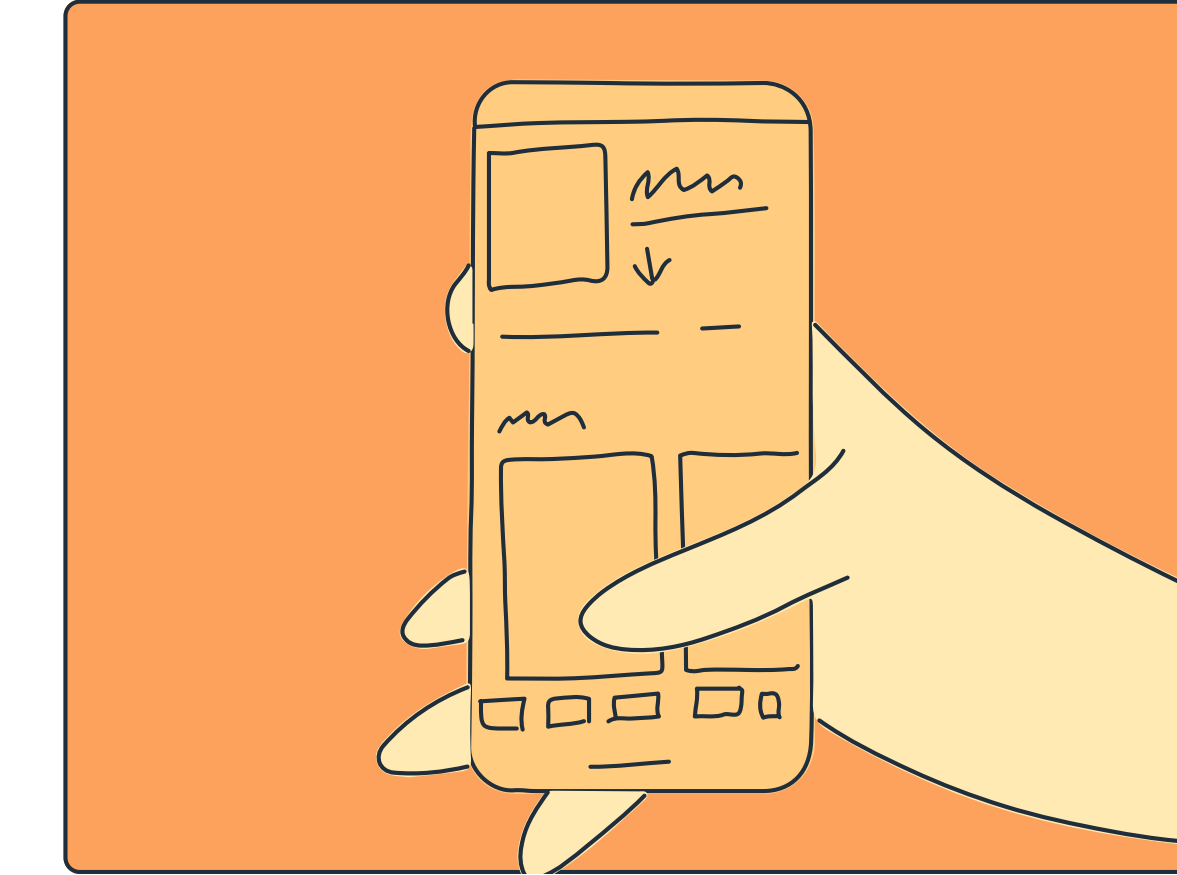
- Assist him in start documenting his daily life to uncover the hidden moments of joy within it
- Supply him with motives and suggestions to help him make friends
- Offer emotional support in various forms and help him find his sense of achievements

Motivations

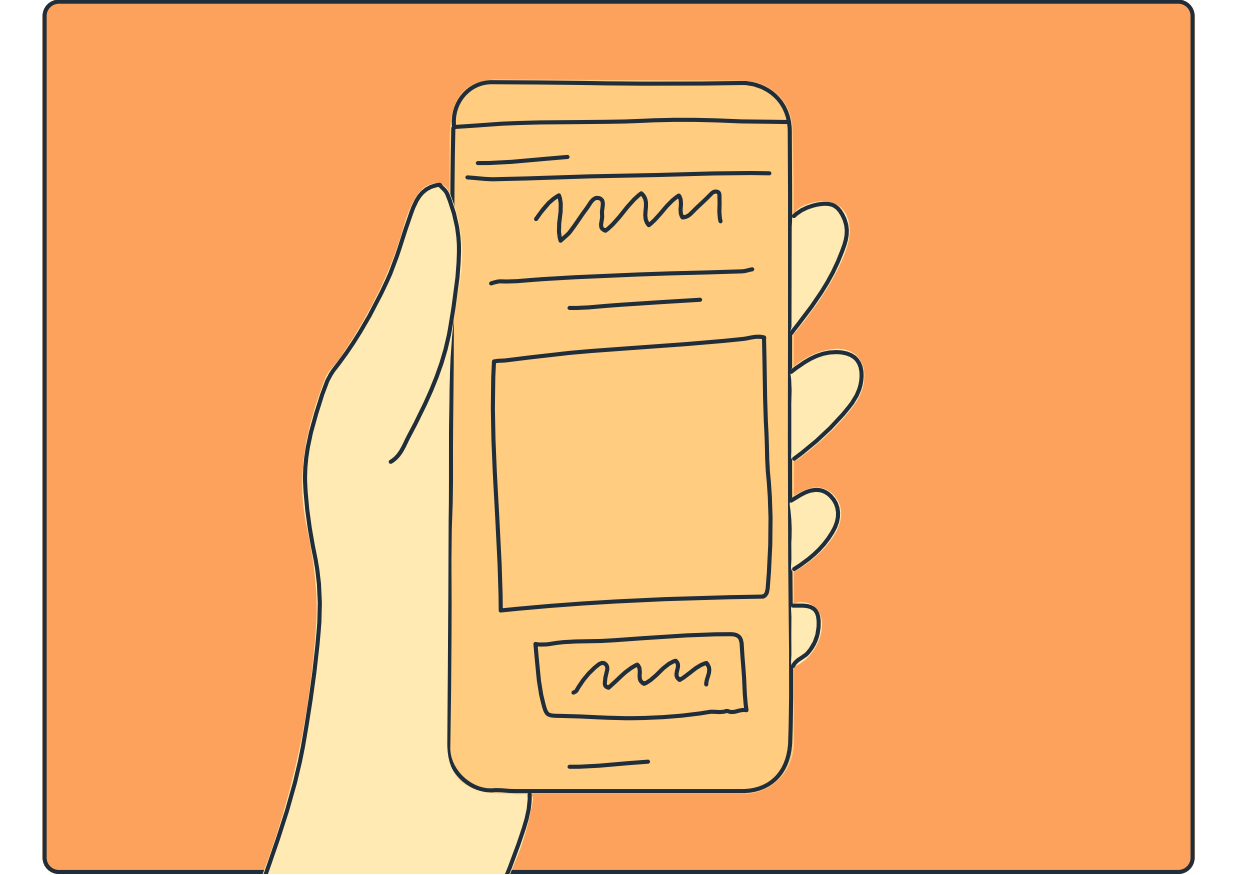
- "I aspire to excel in my job, as I aim to increase my earnings."
- "I want friends. I often feel isolated in this unfamiliar city."
- "I strive to improve my emotional well-being."



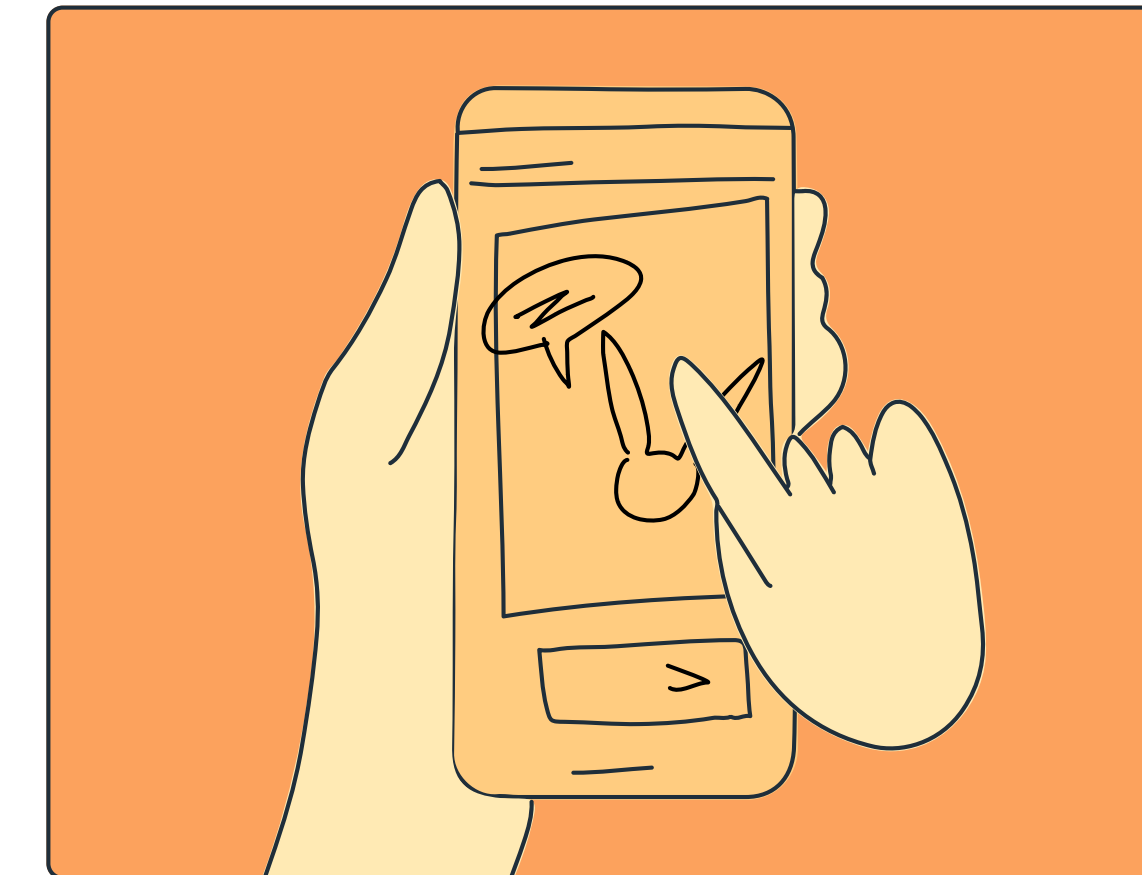
Jun is on his way to work this Monday, and he's feeling a bit reluctant to start the day at the office.



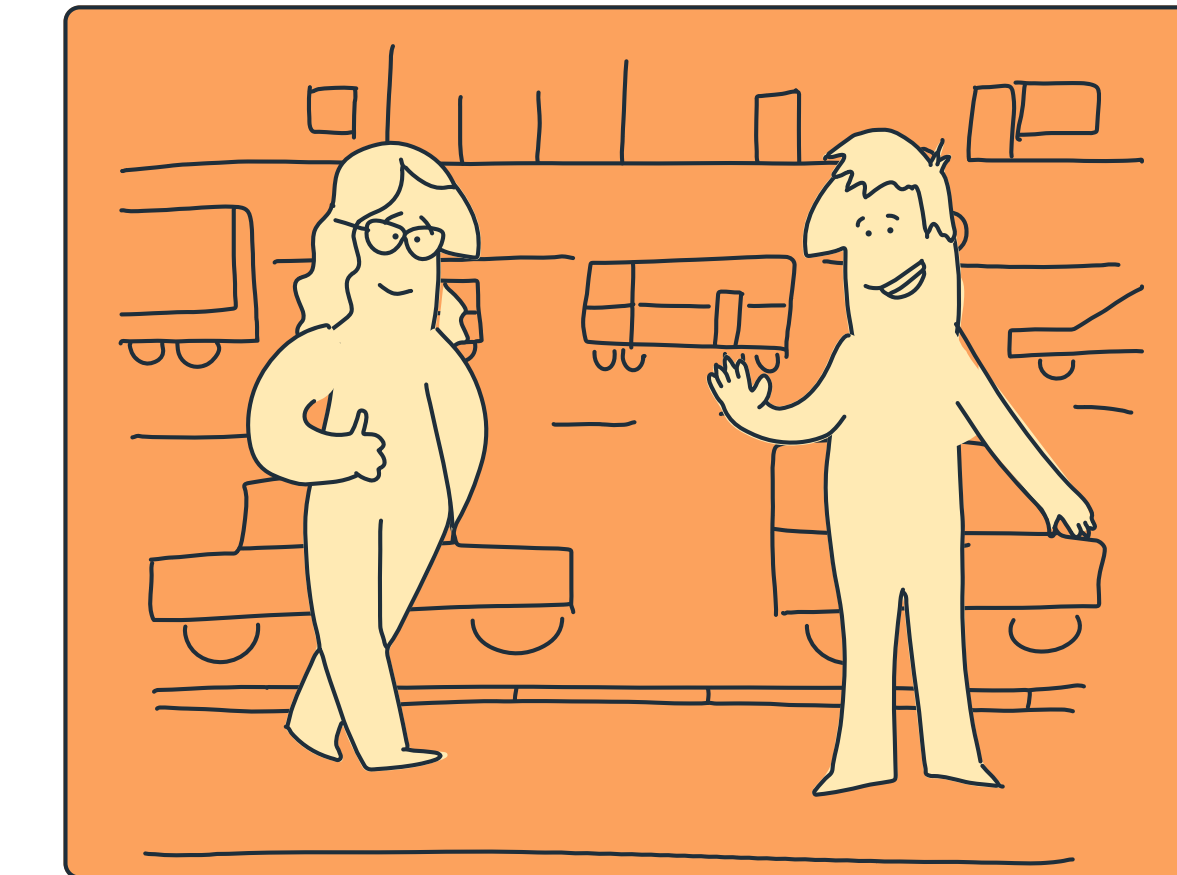
While casually browsing his phone, Jun stumbles upon an appealing app and decides to download it.



After downloading, this app asks Jun for a test, which is kind of annoying. But the interfaces look interesting so he accepts.



Upon completing the test, Jun arrives at the app's homepage and is captivated by a bunny that jumps out of the bushes.



The bunny suggests that Jun should greet a stranger, with some reasons why he should. Encouraged by this, Jun decides to give it a try.



Jun completes it swiftly. Amazingly, it makes him happy. For the rest of his commute, he continues to use the software.

HOW TO USE

Test

After signing up, you are ought to take a quick and skippable mental health test, which is helpful for us to locate your issues.



Meet new friends

Each day, you will meet a new jungle resident at Homepage. They will present a task to you in a suggestive tone.

Content

At Content page, you have various options. You can keep a diary, view pushes and so on.

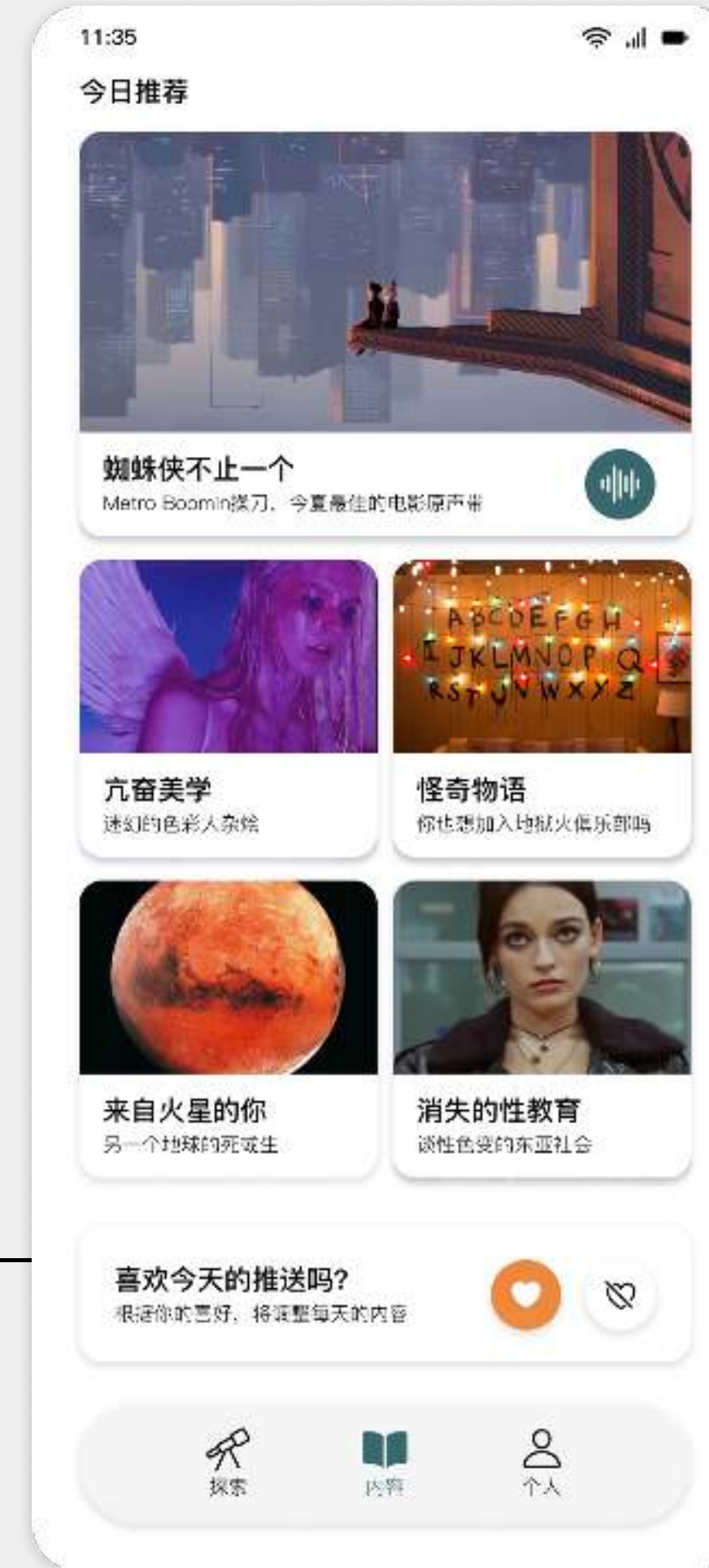


Record your day

Tasks are optional, especially helpful if you're not used to journaling or need a starting point. You're not obligated to follow them; just record your day by your wish.

Daily updates

Check our everyday updates when you are bored. Everyday has a certain theme, and is mental health related.



Feedback

Both each content and all contents of the day have feedback buttons. Actively expressing your preferences can help us more accurately assist you.

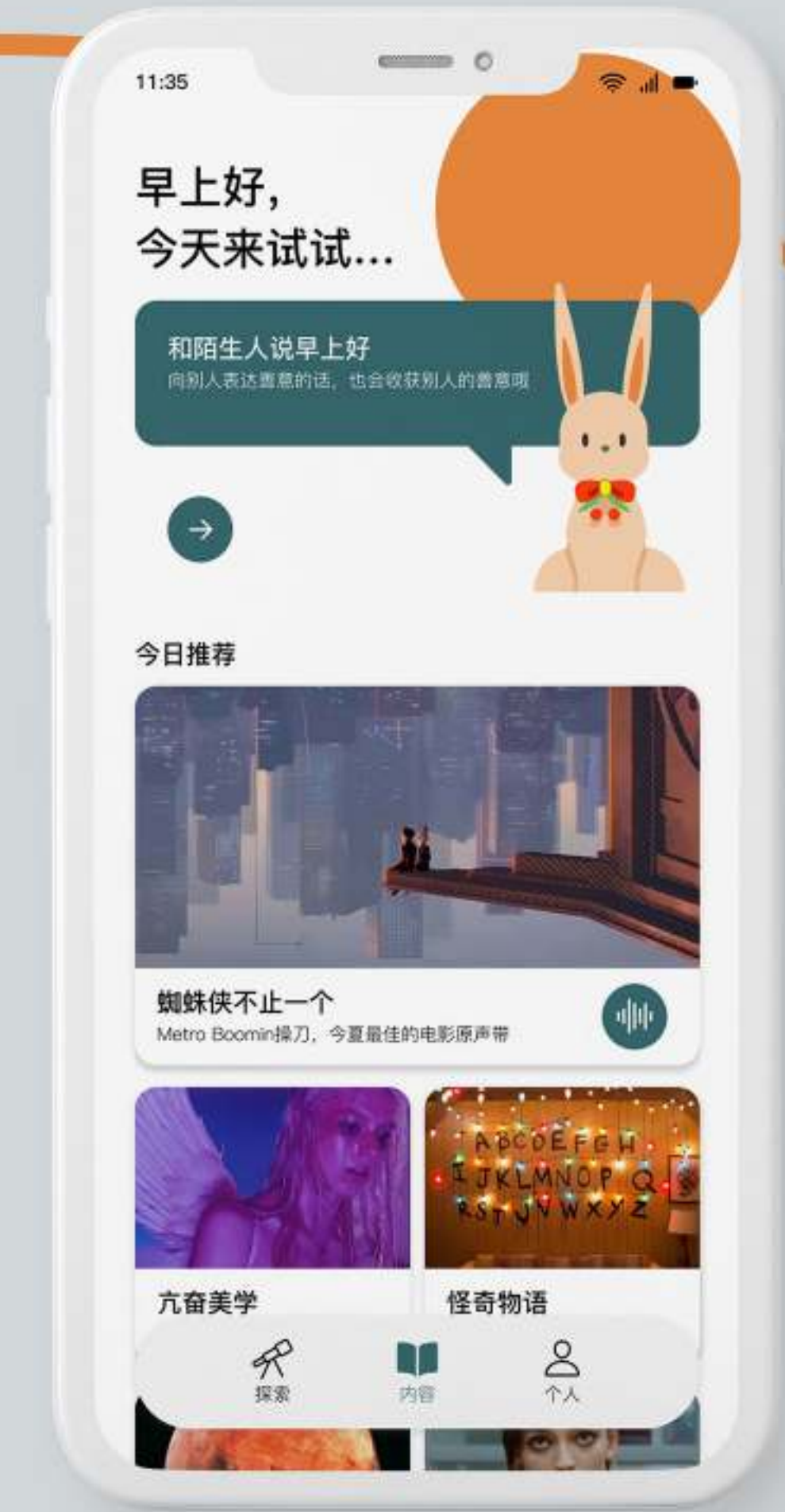
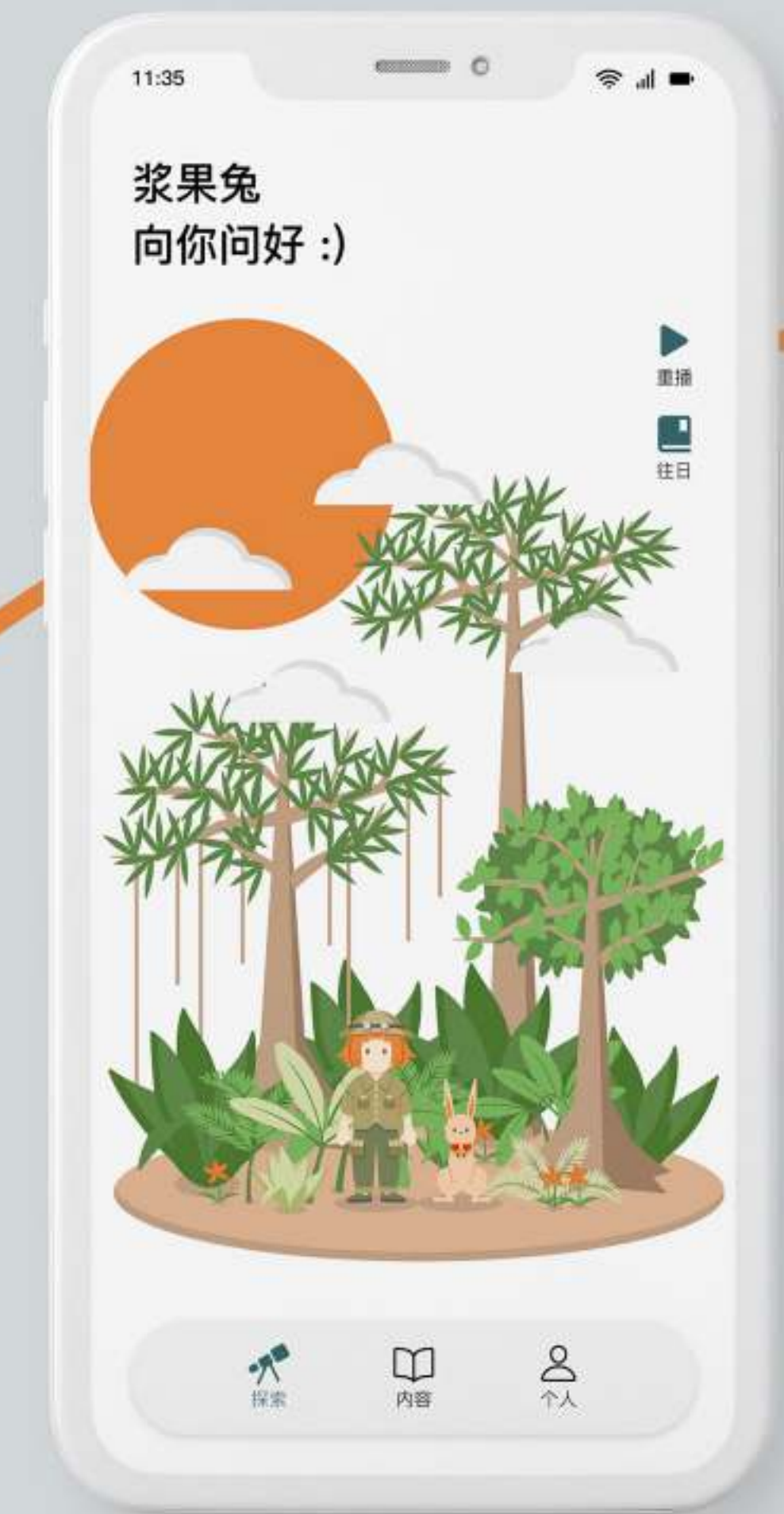
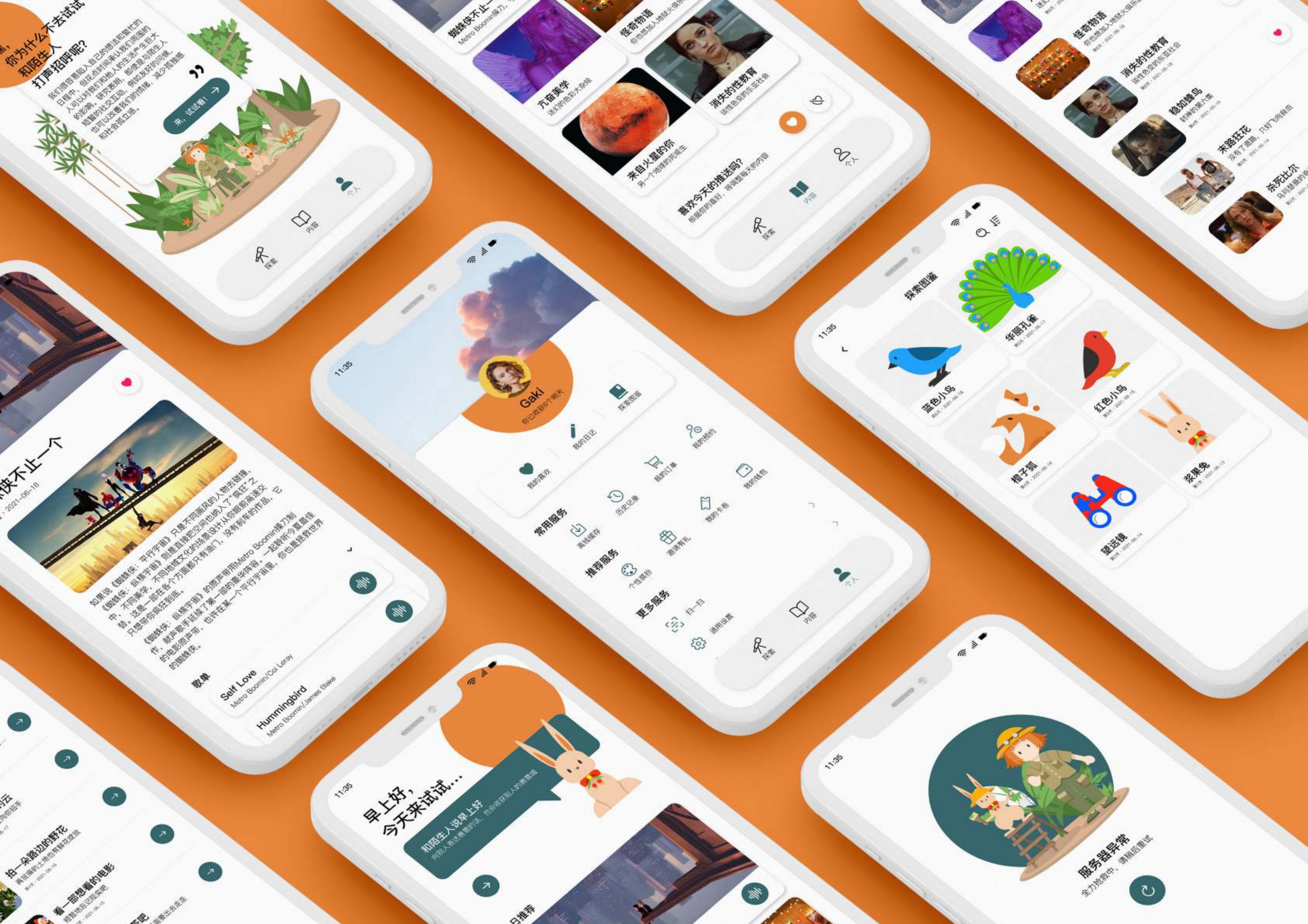
Profile

Edit your personal information and adjust settings at Profile page, where can also help you find your liked pushes and your diary.



Forest of new life

Continuously using this software, you will find that the originally empty jungle will gradually come to life. We hope your mental health is the same.



Check our prototype demo video here:
<https://youtu.be/0SI-2wgax0s>

EmoEar

Interactive Device for Emotion Monitoring

Duration 3 months

Year 2021

My Roles Coding, designing prototype, soldering circuits

Team Members Jiaqi Zhang, Zhiman Niu, Ziyi Wang, Xinyue Yin

PROPOSAL

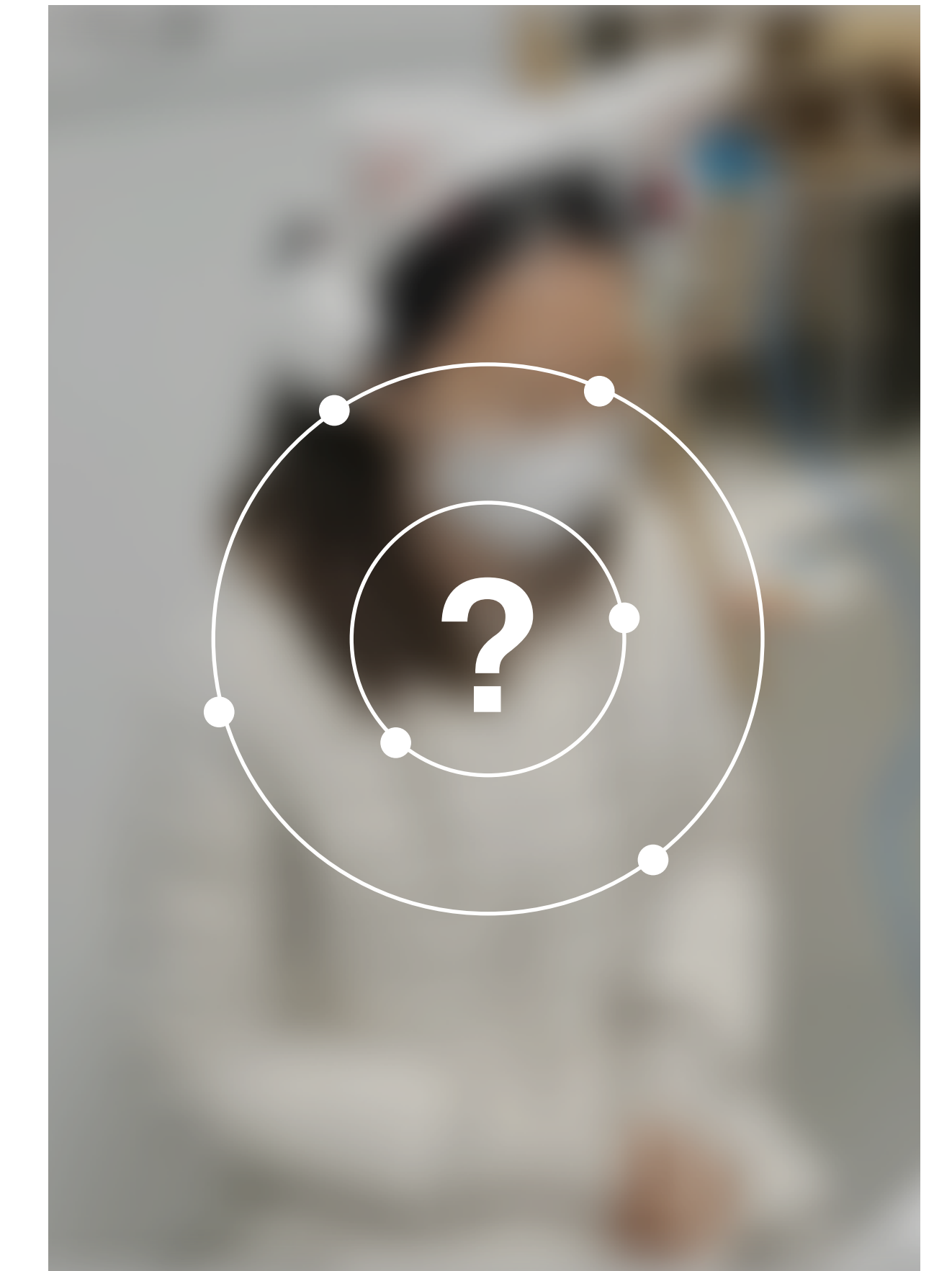
Inspired by the ears of feline creatures, we wanted to design a cat ear headband that more openly reflects the wearer's emotions.



Humans usually don't express their emotions naturally and directly.



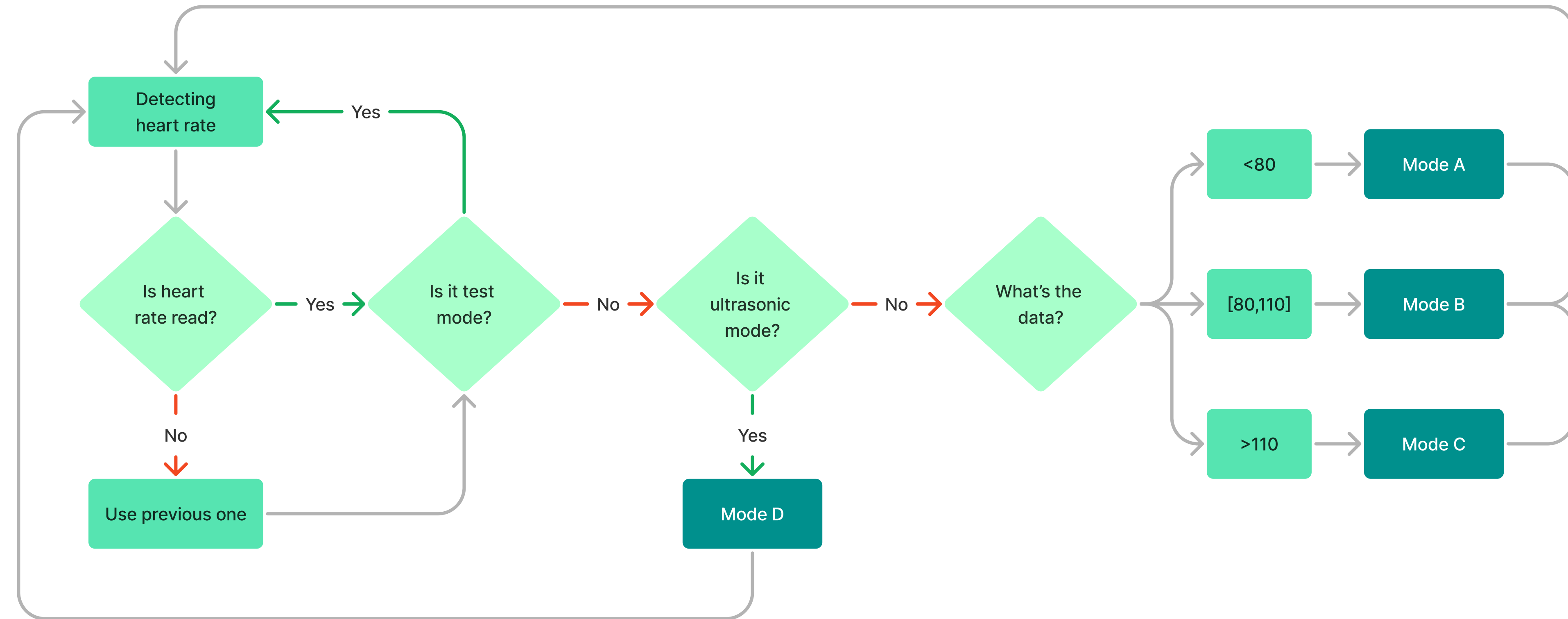
Animals, like cats, their feelings can be easily seen by their ears or tails.



What if humans have a pair of cat ears and it can react to their feelings?

MAIN LOOP

From detecting the pulse to move the cat ears, several judgments are required, lead to four different modes, which are mode A, B, C, and D. The simplified main loop is as follows.



// Main Loop

```

74 // Main Loop
75
76 void loop() {
77
78 // Heartrate
79 BPM_current= AdjustPulseSensor();
80
81 if(BPM_current==0){
82   BPM_current=BPM_former;
83 }
84
85 if(count>10 && Ultrasonic()){
86   if(BPM_current<80){
87     sweep2();
88     show(0);
89   }else{
90     if(BPM_current<110){
91       sweep1();
92       show(1);
93     }else{
94       swing();
95       show(2);
96     }
97   }
98 }
99 BPM_former=BPM_current;
100 }
  
```

// Hearbeat Reading

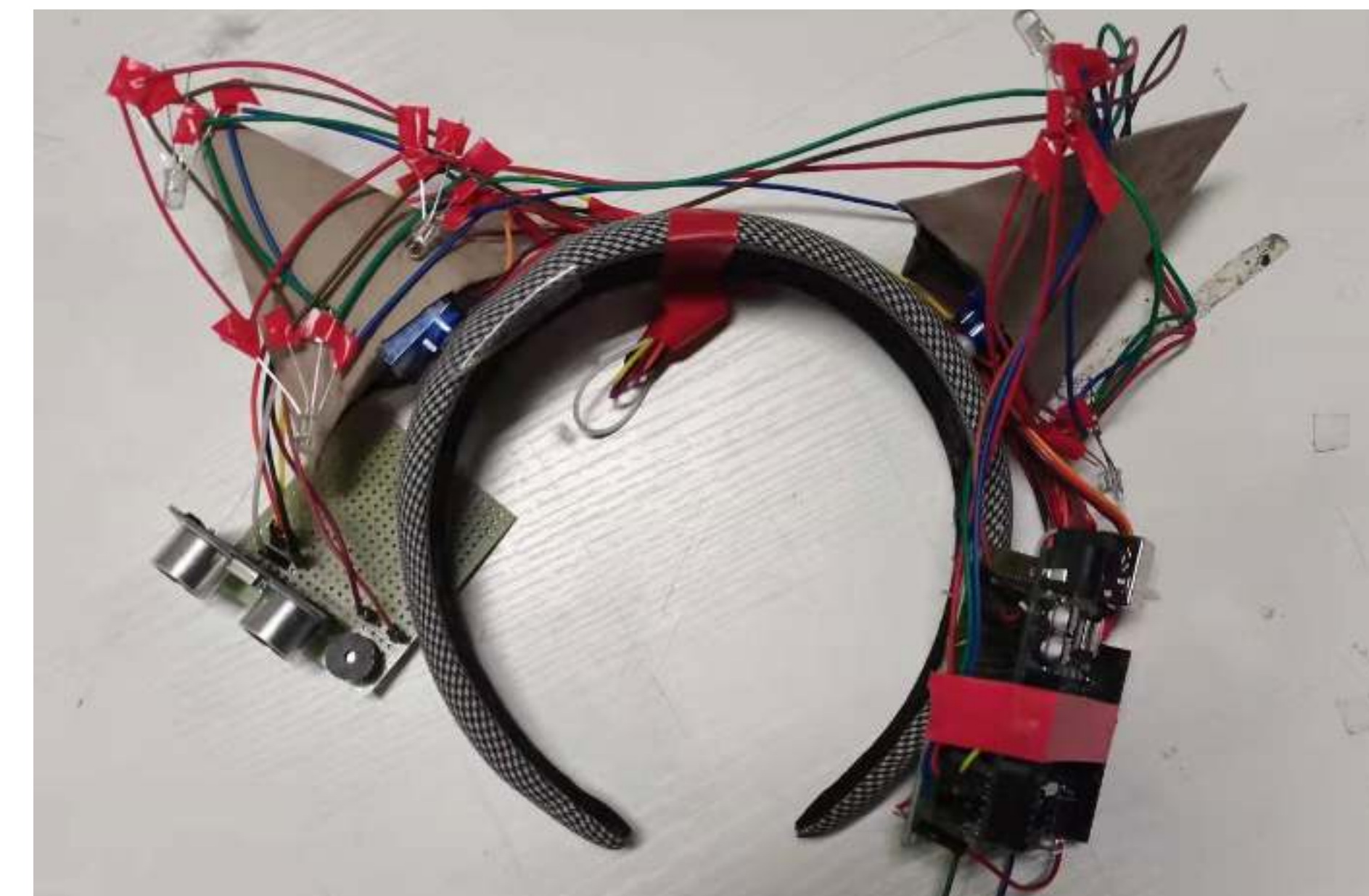
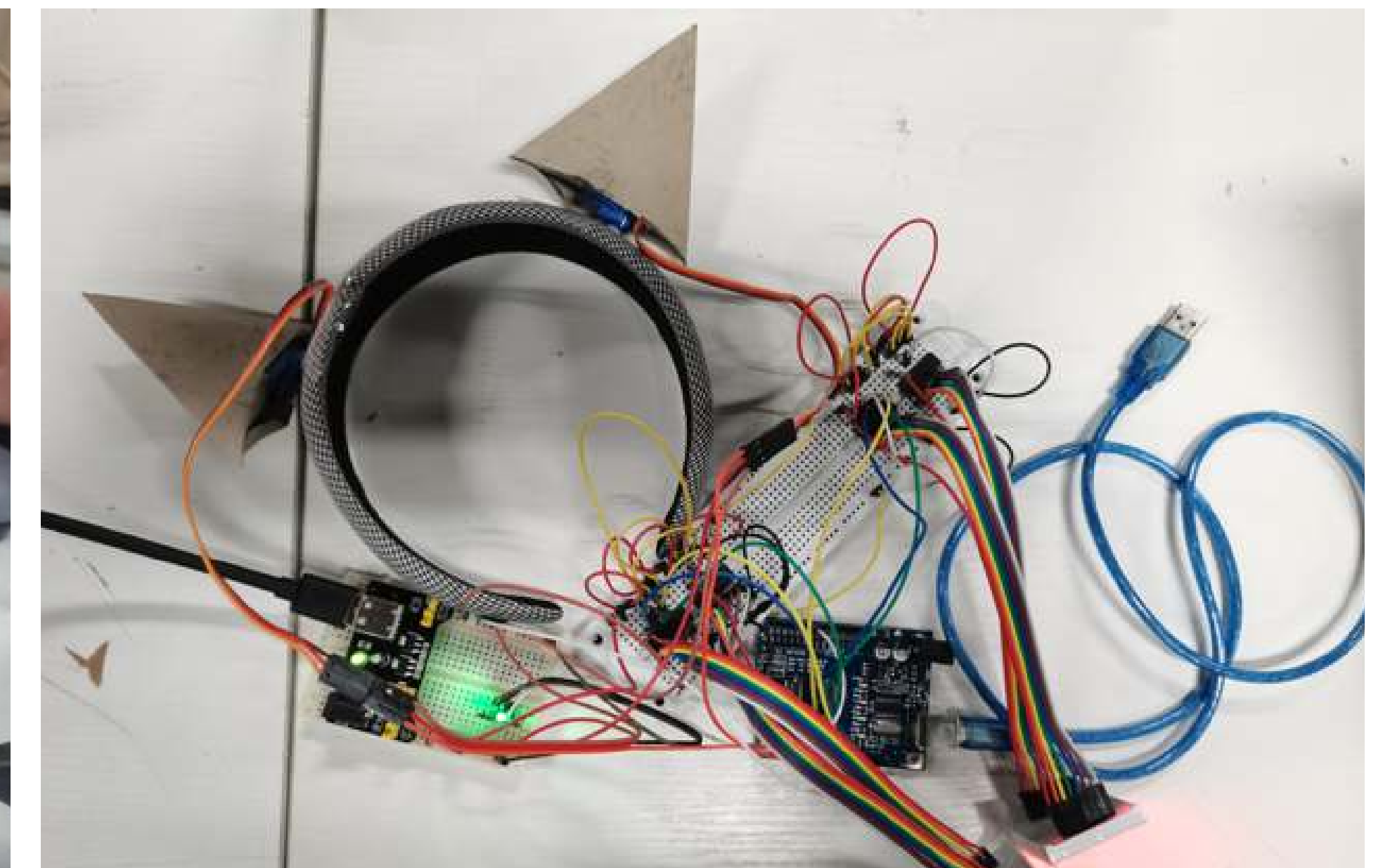
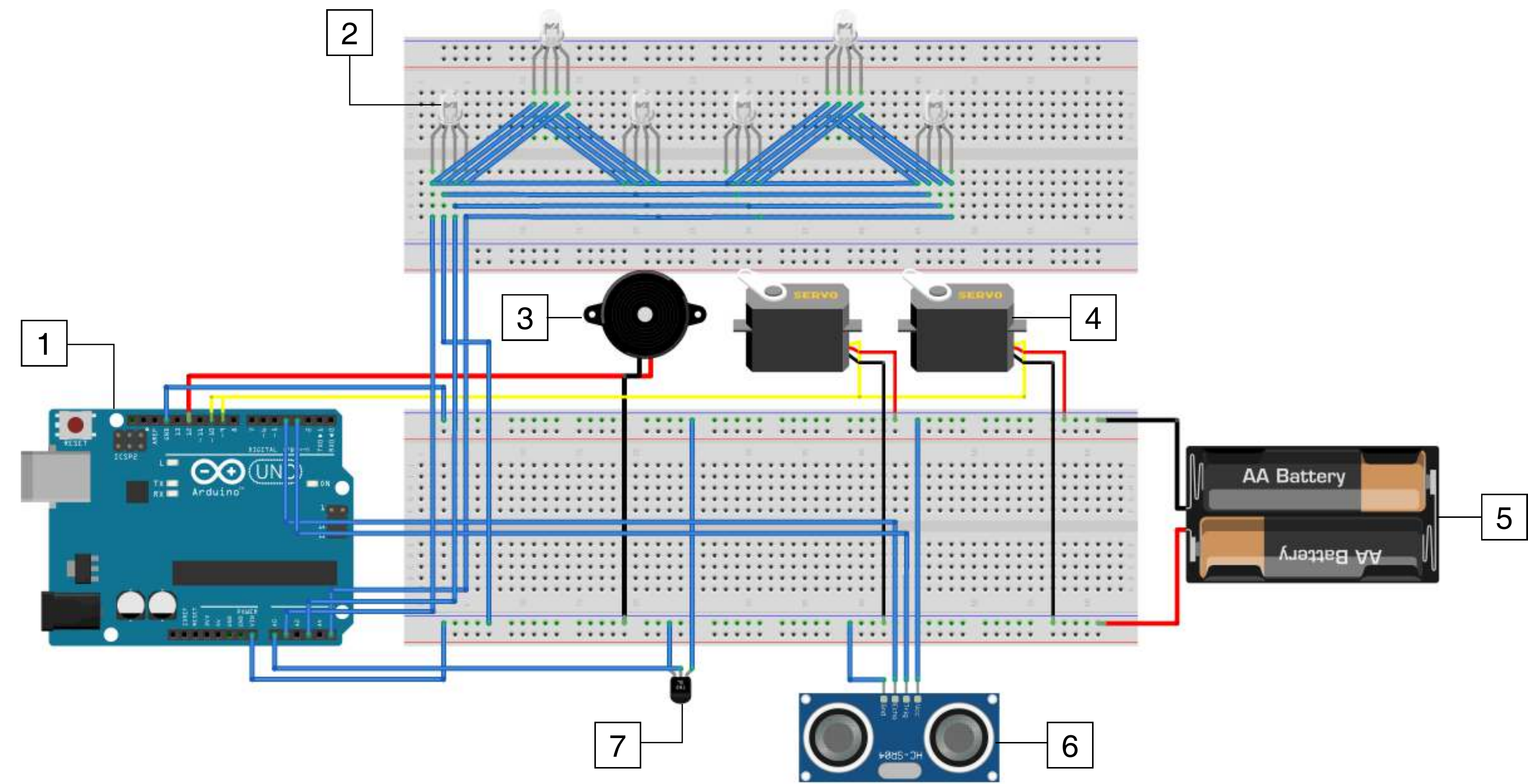
```

104 // Heartrate
105 int AdjustPulseSensor(){
106
107 int BPM=pulseSensor.getBeatsPerMinute(); //PulseSensor
108
109 if(pulseSensor.sawStartOfBeat() && BPM<130 && BPM>50){
110   count+=1; //计数器
111   if(count<=5){
112     /*
113     * 经过多次试验观测得出，前5次测量数据(count 1~5)非常
114     */
115     Serial.print("Adjusting.....");
116     Serial.println(count);
117     Serial.println("-----")
118   }else{
119     if(count<=10){
120       /*
121       * 前5到前10次数据(count 06~10)作为测试数据，以得出
122       */
123       test_hearttrate[count-6]=BPM;
124       Serial.println("Testing.....");
125       Serial.print("Test BPM:");
126       Serial.println(BPM);
127       Serial.println("-----")
128     }else{
129       if(count==11){
130         /*
131         * 从第11次开始测量，数据可以正式使用
132         */
133         for(int i=0;i<5;i++){
134           u+=test_hearttrate[i];
135         }
136         u=u/5;
137         Serial.print("Test finished!Your average hear");
138         Serial.println(u);
139         Serial.print("Your BPM:");
140         Serial.println(BPM-u+IdealAverage);
141         Serial.println("-----")
142       }else{
143         Serial.print("Your BPM:");
144         Serial.println(BPM-u+IdealAverage);
145         Serial.println("-----")
146       }
147     }
148   }
149 }
  
```

// Servo

```

223 // Servo
224 void sweep2(){
225   for (pos = 0; pos <= 30; pos += 1) {
226     servo_10.write(pos);
227     servo_9.write(30-pos);
228     delay(15);
229   }
230   for (pos = 30; pos >= 0; pos -= 1) {
231     servo_10.write(pos);
232     servo_9.write(30-pos);
233     delay(15);
234   }
235 }
236
237 void sweep1(){
238   for (pos = 0; pos <= 30; pos += 3) {
239     servo_9.write(pos);
240     servo_10.write(30-pos);
241     if(pos==30){
242       delay(1000);
243     }
244     delay(15);
245   }
246   servo_9.write(0);
247   servo_10.write(30);
248 }
249
250 void swing(){
251   for (pos = 30; pos <= 90; pos += 15) {
252     servo_10.write(pos);
253     delay(500);
254   }
255   for (pos = 90; pos >= 30; pos -= 15) {
256     servo_10.write(pos);
257     delay(500);
258   }
259 }
  
```

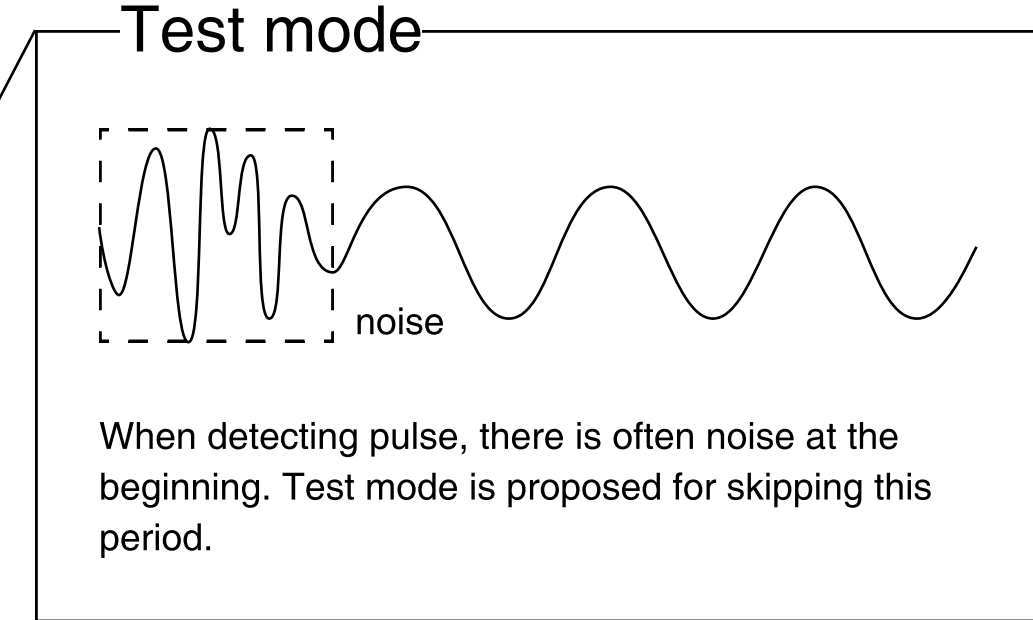
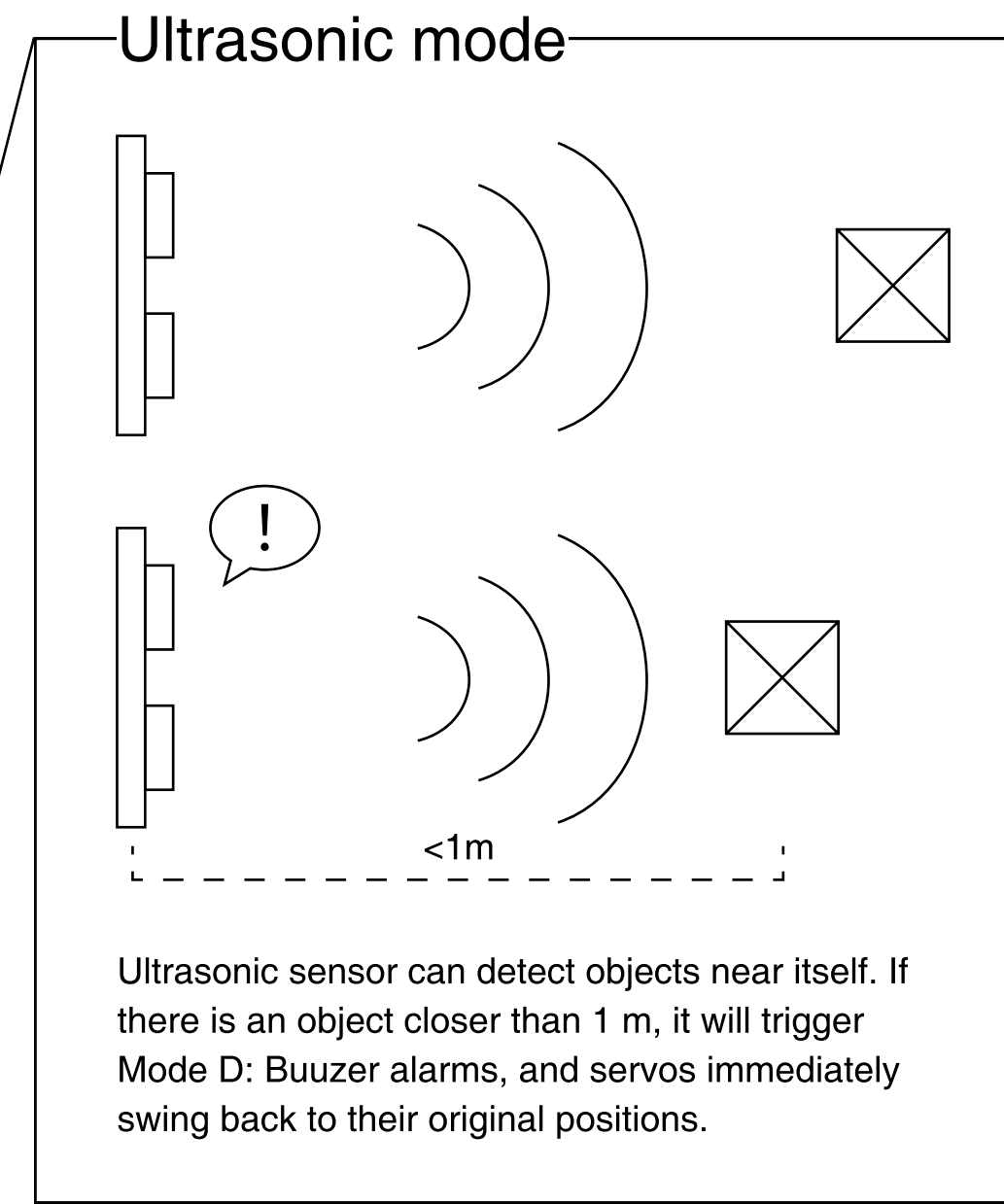
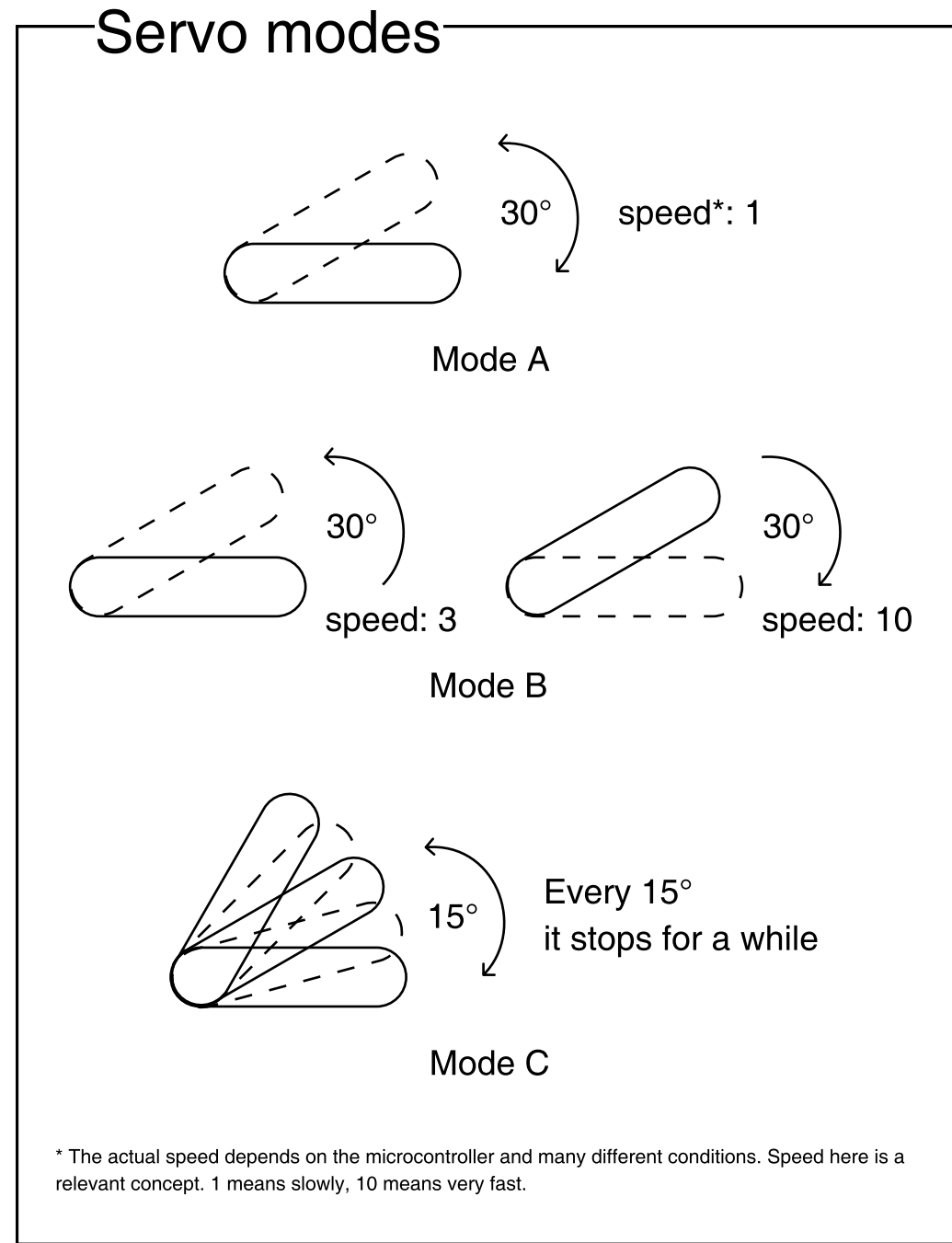
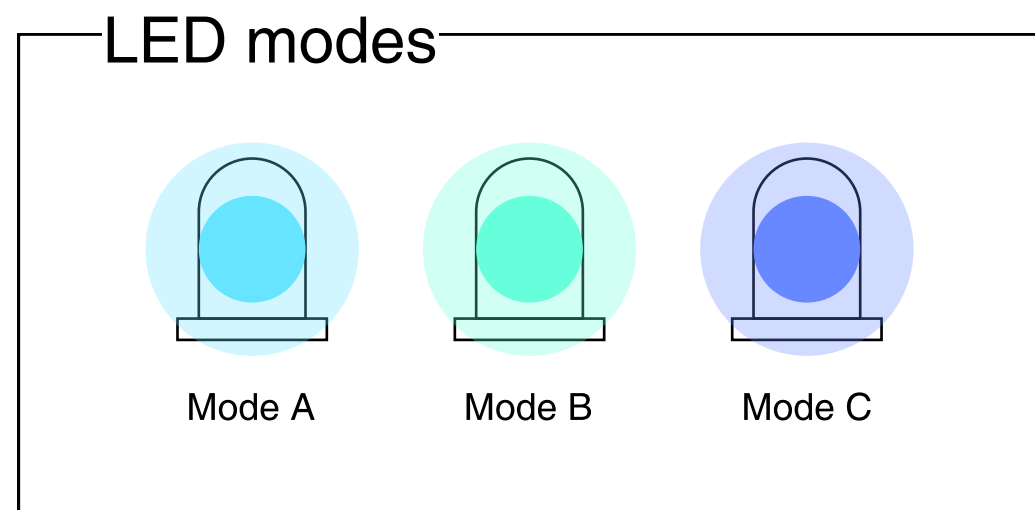
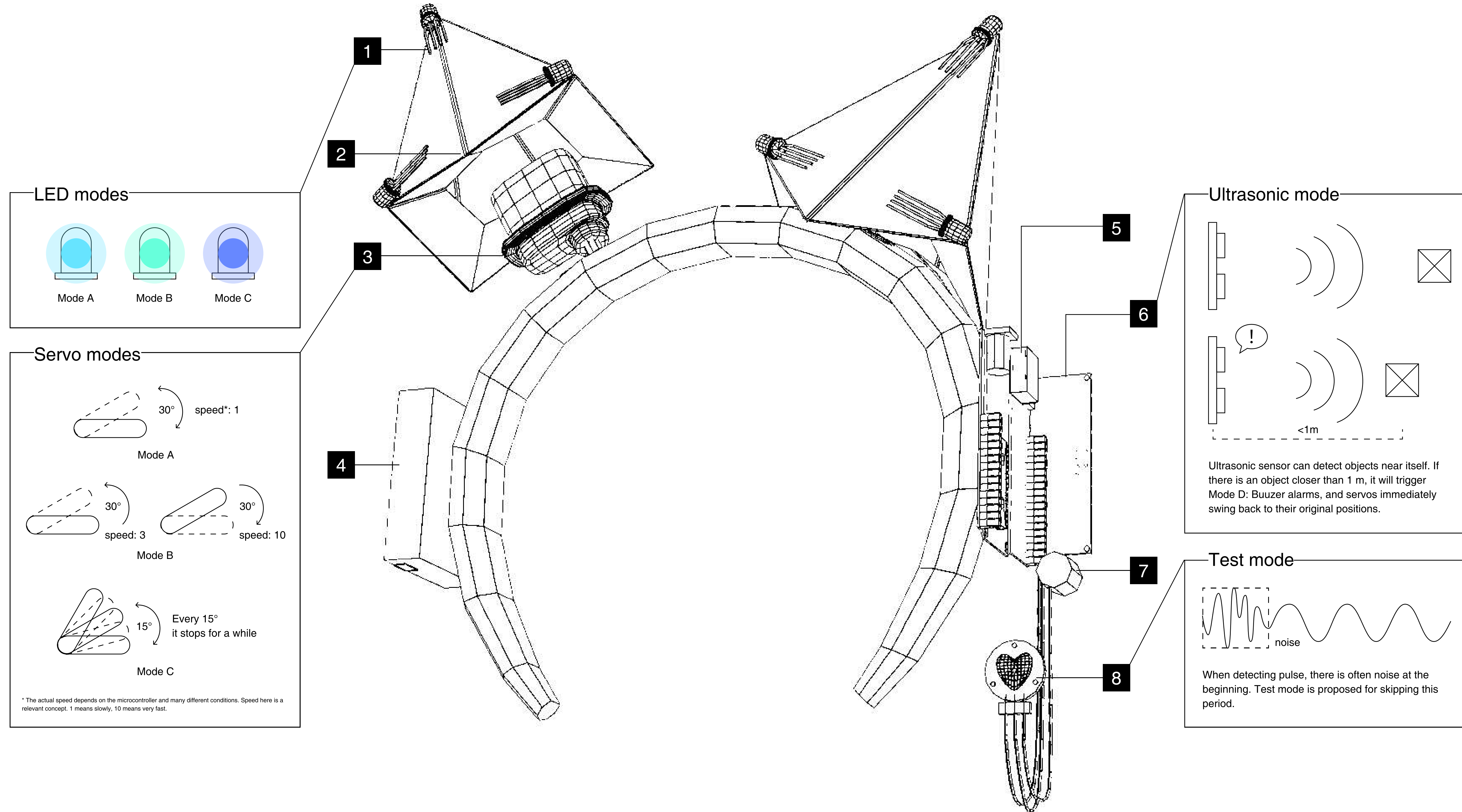
INSTRUCTIONS

1 RGB LED
Three RGB LEDs for each ear. Each mode has its own color.

2 Frame of the Cat Ear
There are two layers. The first layer is made of cardboard with LED lights fixed on it. The second one is a plush decoration, which is not shown in this graph.

3 Servo
To swing the ears. Each mode has its own swinging mode.

4 Batteries
For power supply. Use two 1.5V batteries installed in the battery box.

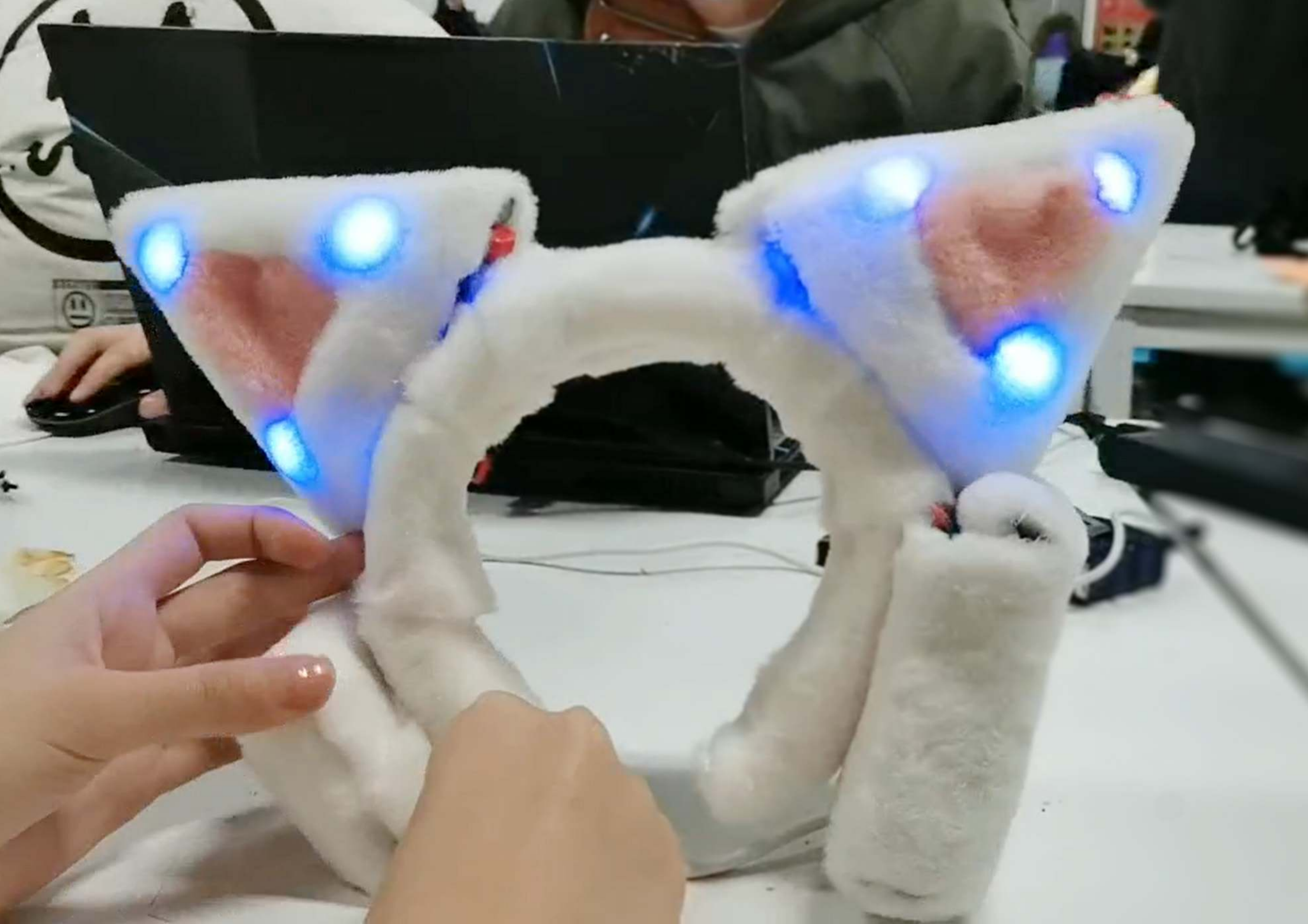


Arduino UNO **5**
Development board. Program written in Arduino IDE will be burned in it.

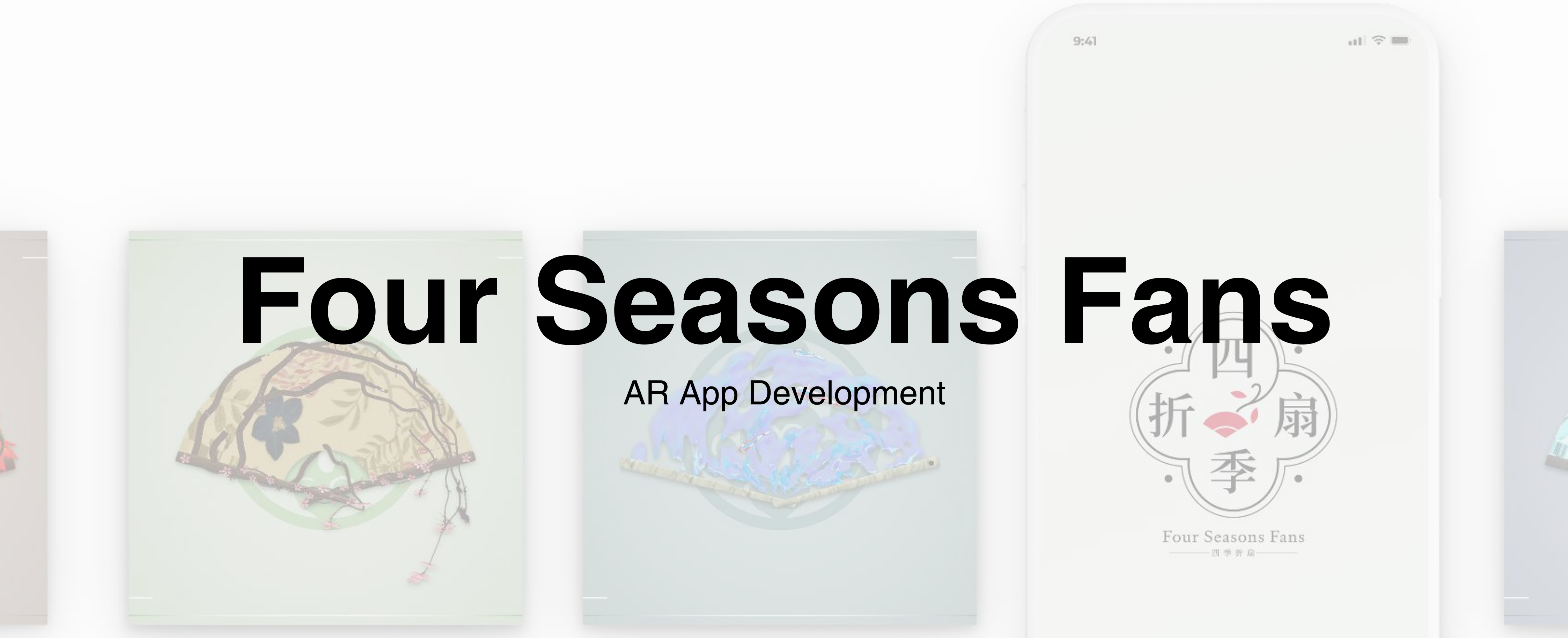
Ultrasonic Sensor **6**
In conjunction with the buzzer, for detecting any approaches behind.

Buzzer **7**
In conjunction with the ultrasonic sensor, for alarming the user.

Heartrate Sensor **8**
To detect the user's heartrate. Use an ear clip to clip onto the user's earlobe.



Check our demo video here:
<https://youtu.be/fKMHX68eHgl>



Duration 2 months
Year 2023
My Roles Coding, modeling, UI designing
Team Members Jiaqi Tan, Yunhua Tan, Jiaqi Zhang, Liwen Yi, Yi Deng

PROPOSAL

We wanted to merge traditional Chinese culture with cutting-edge technology, so after brainstorming, we had the idea of creating an AR folding fan project to showcase the beauty of the seasons.



"Four Seasons of Flowers and Birds" by Lv Ji, Ming Dynasty.

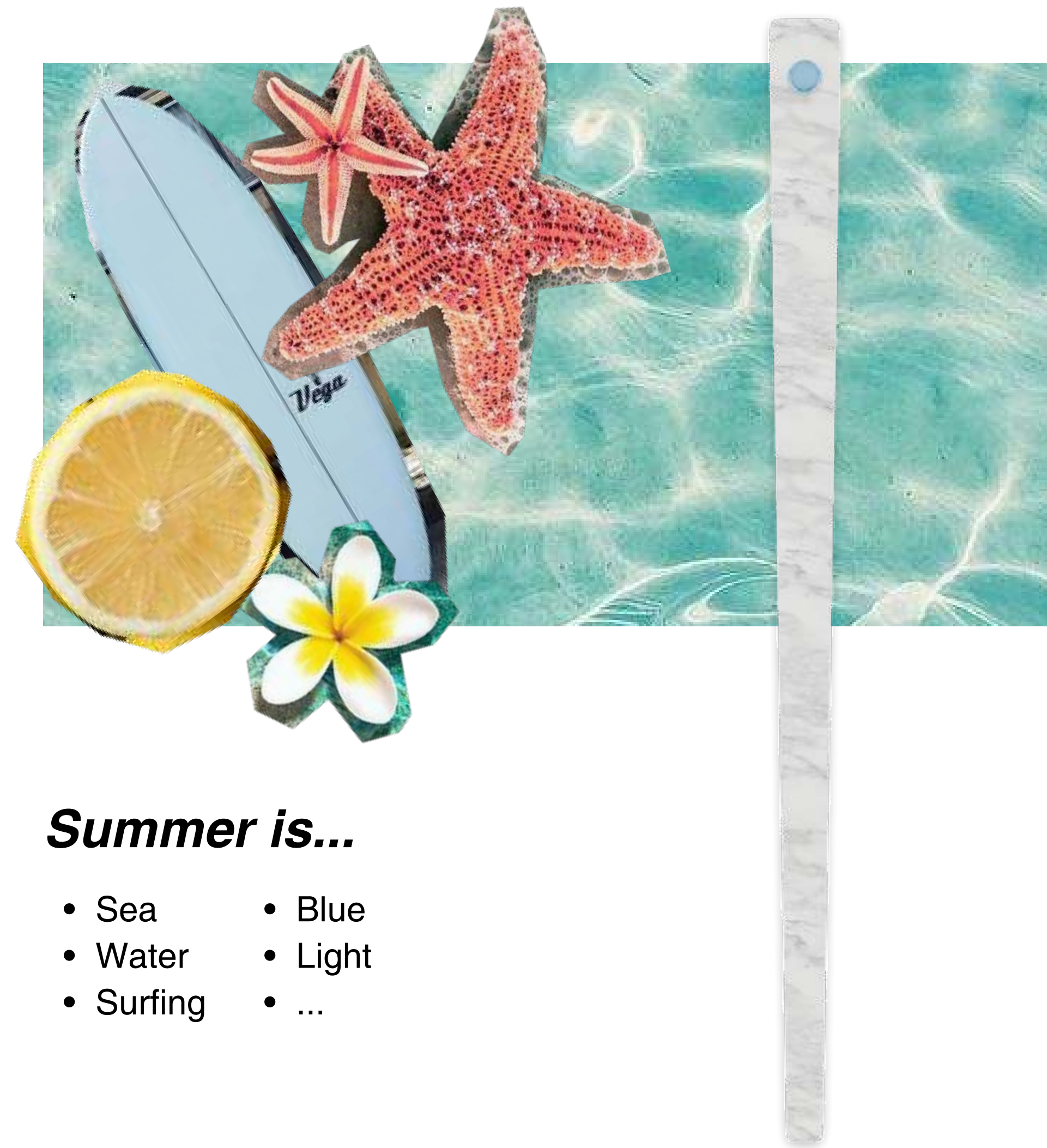
The folding fan, an essential part of Chinese traditional culture, carries rich cultural and historical value. Beyond its utilitarian function as a cooling device, it also served as a canvas for artistic expressions in ancient China. Furthermore, the four seasons have held a pivotal role in Chinese art for centuries. This has ignited our curiosity: What if we were to harness modern technologies, such as shaders, to craft contemporary fan art and bring it to life through the immersive medium of AR?

FAN HANDLE DESIGN



Spring is...

- New life
- Bud
- Flowers
- Vines
- Pink
- ...



Summer is...

- Sea
- Water
- Surfing
- Blue
- Light
- ...



Autumn is...

- Maple
- Warm
- Cozy
- Pumpkin
- Red
- ...

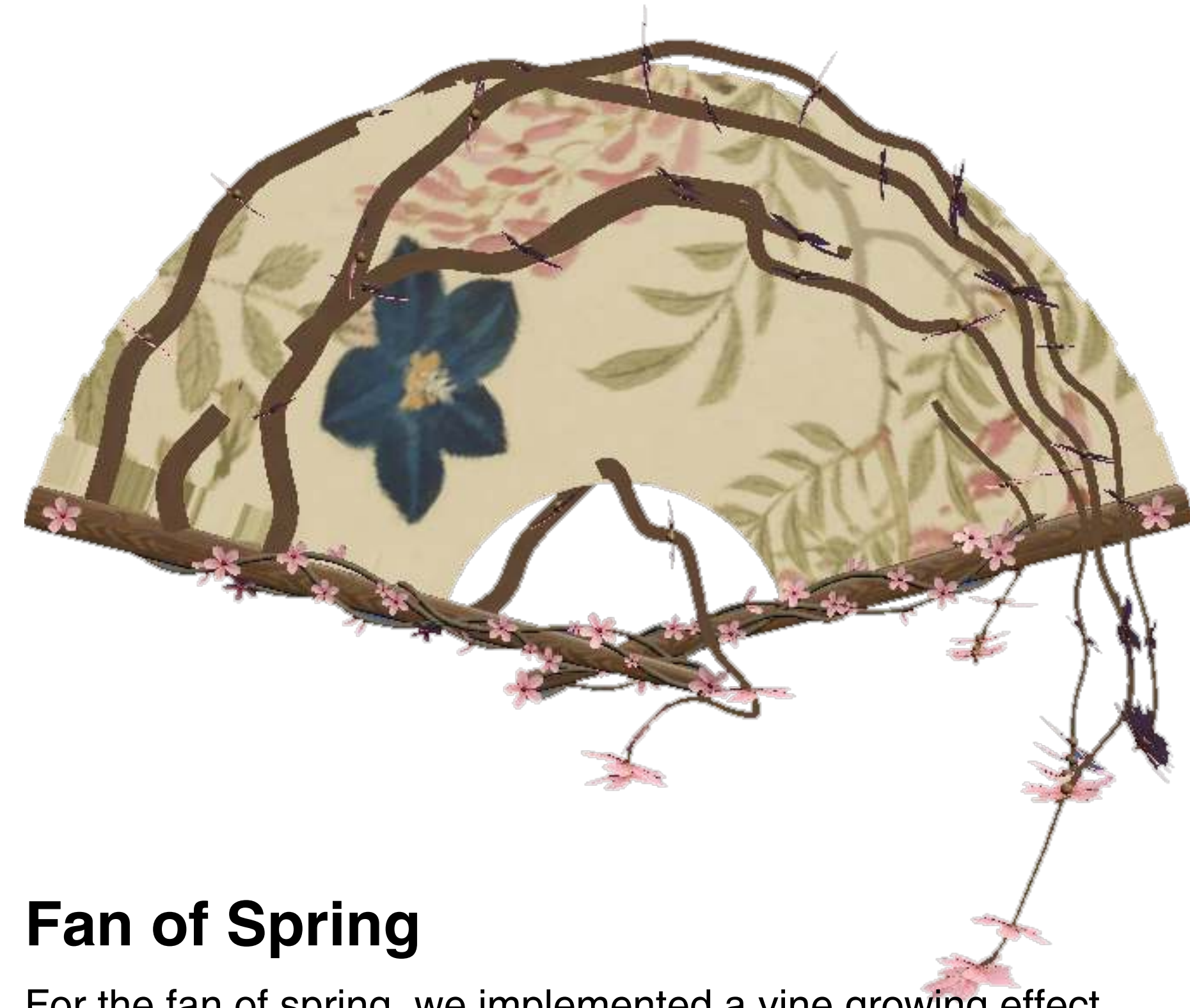


Winter is...

- Snowy
- Icy
- Cold
- Lifeless
- Grey
- ...

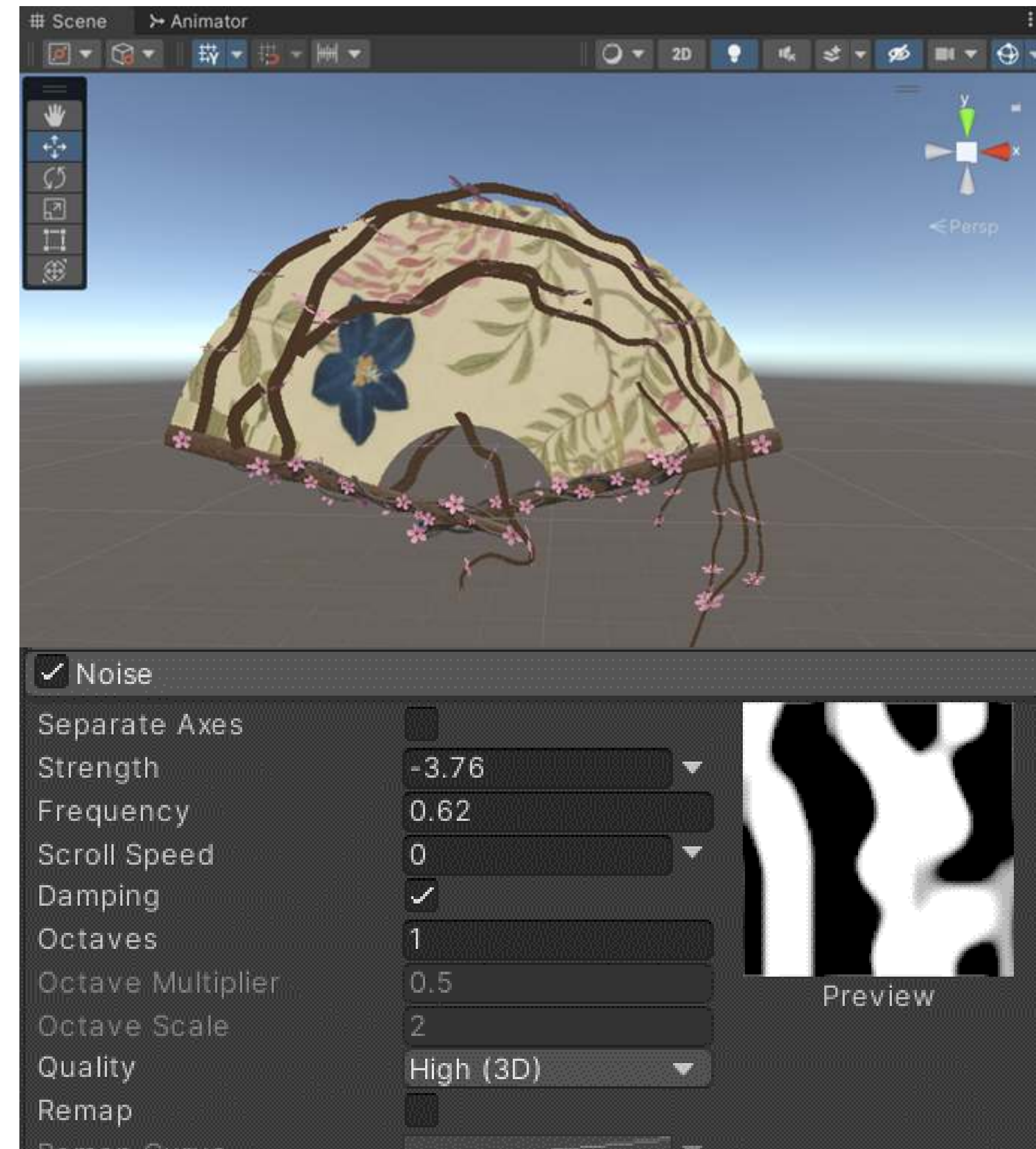
The folding fan can be roughly divided into two parts: the handle and the fan face. For the handles, I created mood boards for each season and then used Blender to model them.

FAN FACE DESIGN

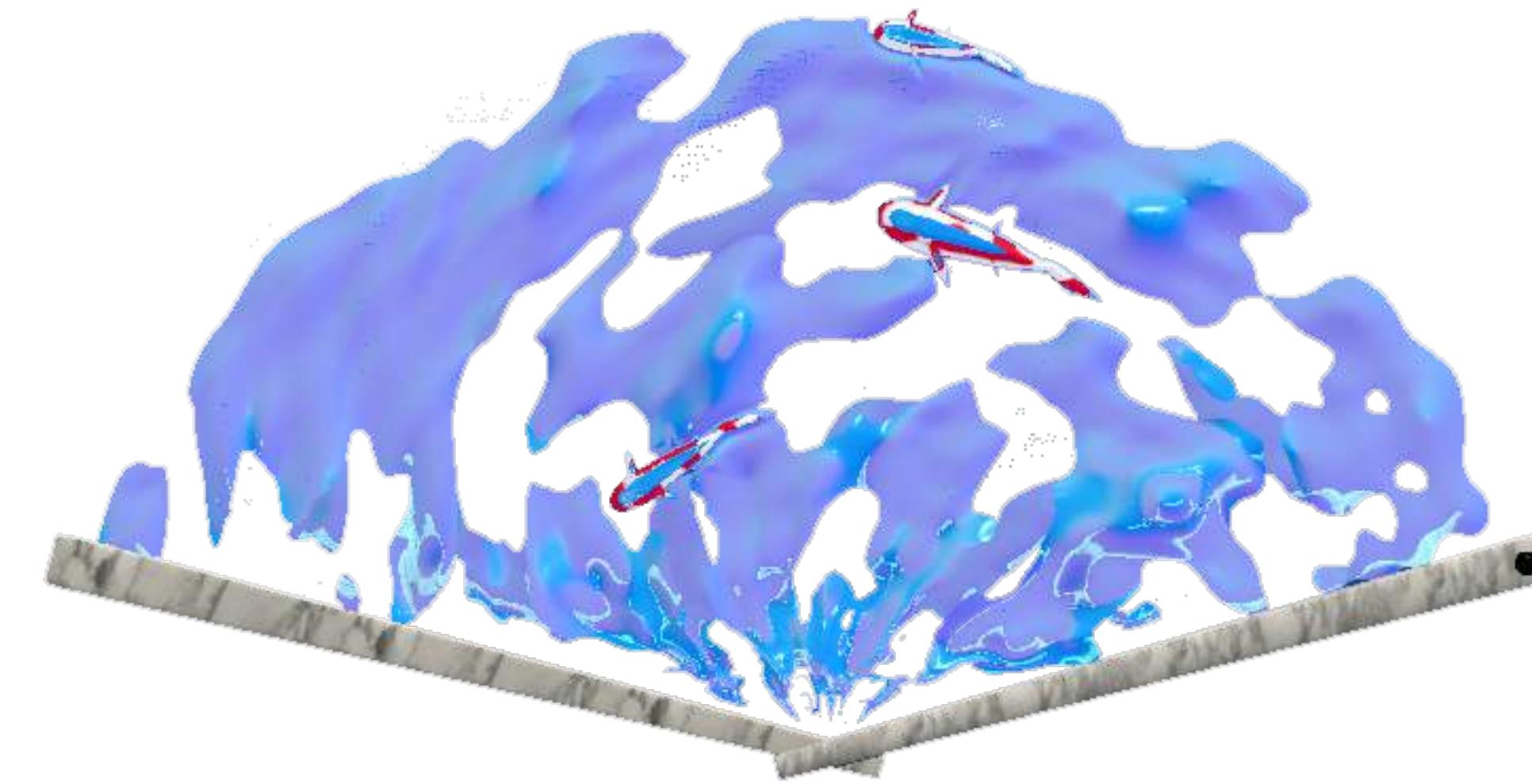


Fan of Spring

For the fan of spring, we implemented a vine growing effect, using particle system. Through adjusting parameters, we could define vine's shape, material, growing speed and so on. The top-right image shows our testing process, and the bottom-right image is one of the parameters called "Noise", which defines the degree of distortion of vines.

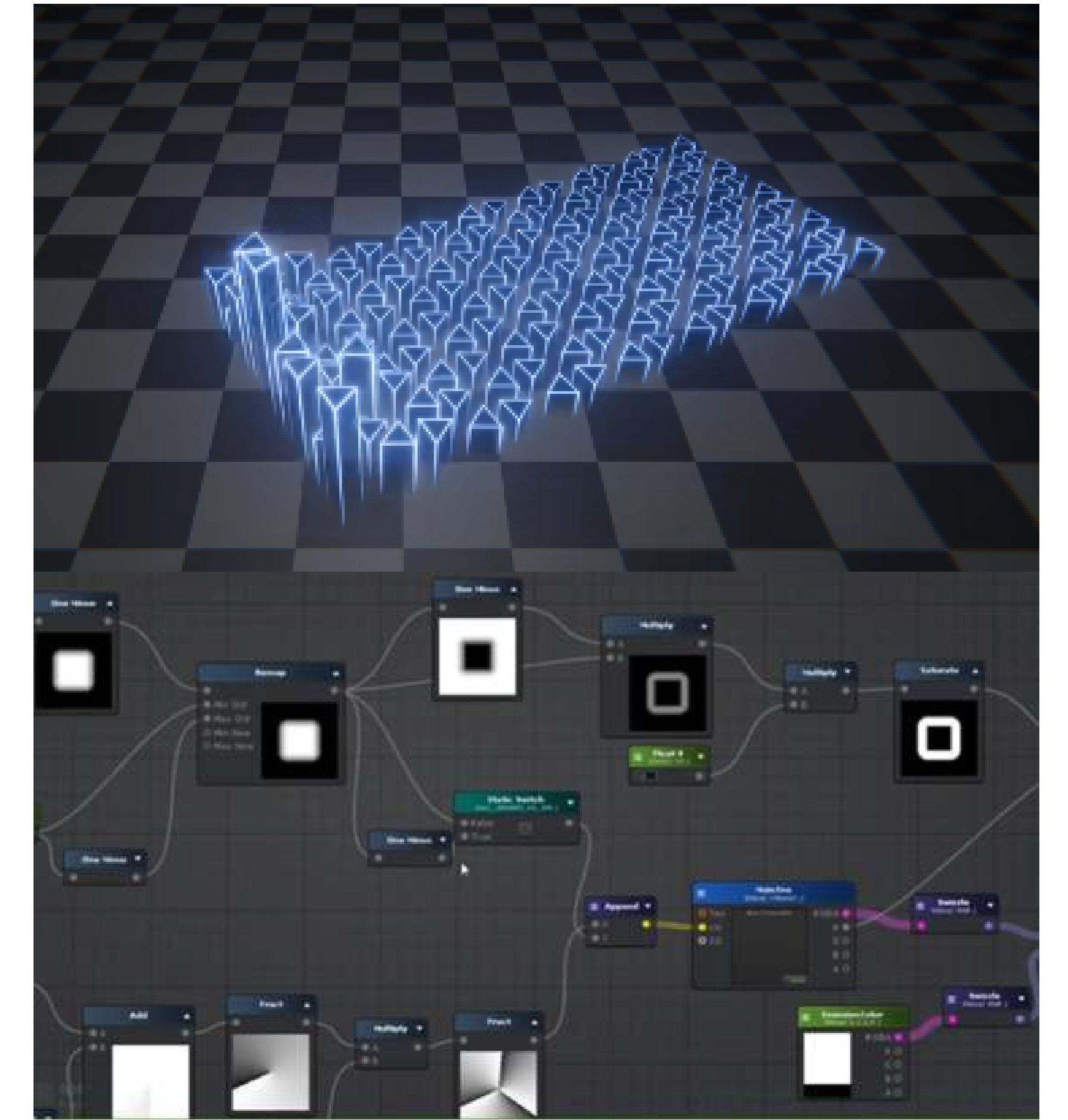


Spring & Summer



Fan of Summer

For our summer-themed fan, we envisioned a water-based design. Crafting this water fan involves complex processes like UV flow, mask testing, polar coordinate rotation, and more. A key element is the time-controlled UV flow, which enables us to simulate water flow. The top-right image illustrates this UV flow, while the bottom-right image displays polar coordinate shader connections created with a mask for the fan shape.

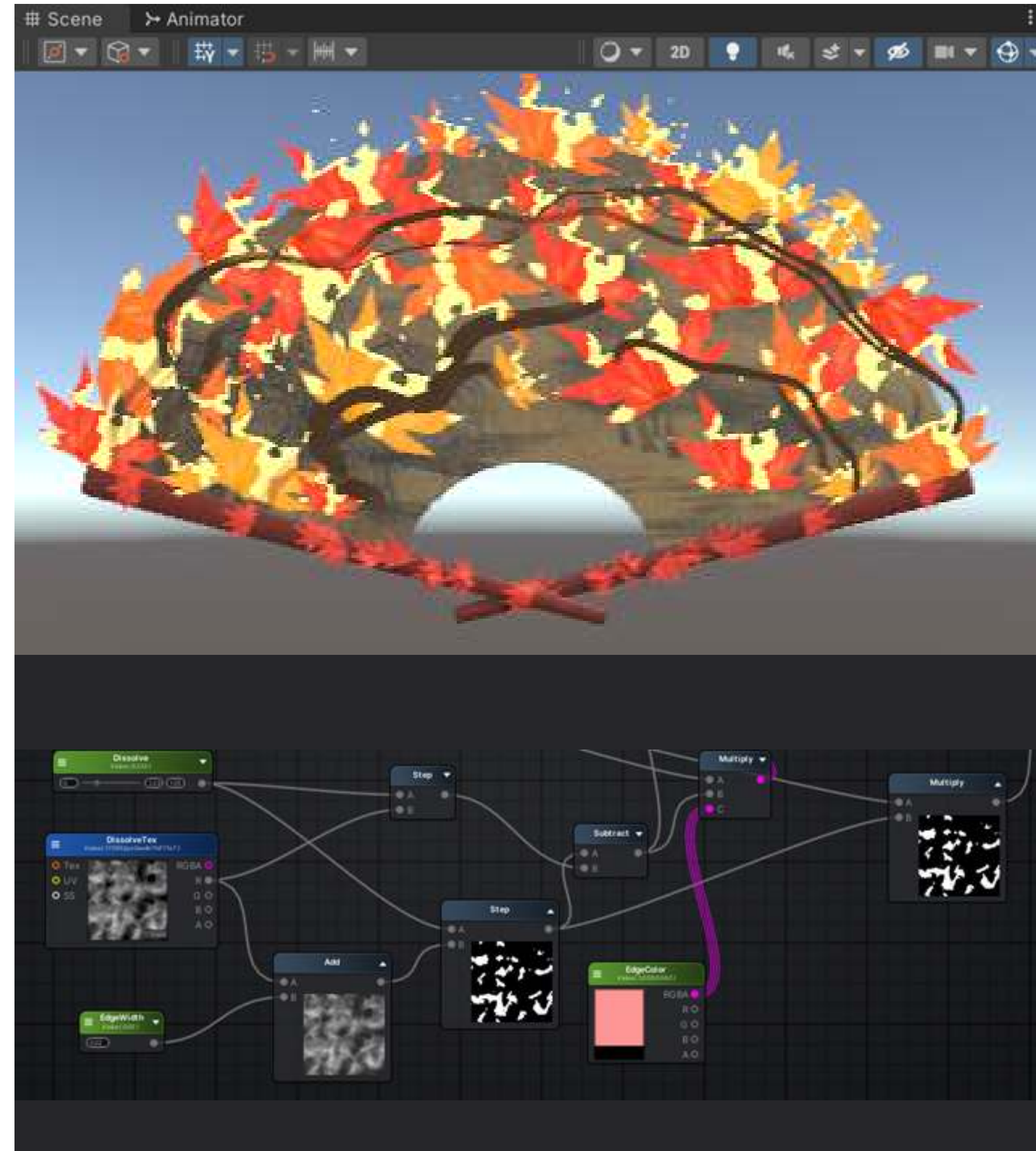


FAN FACE DESIGN

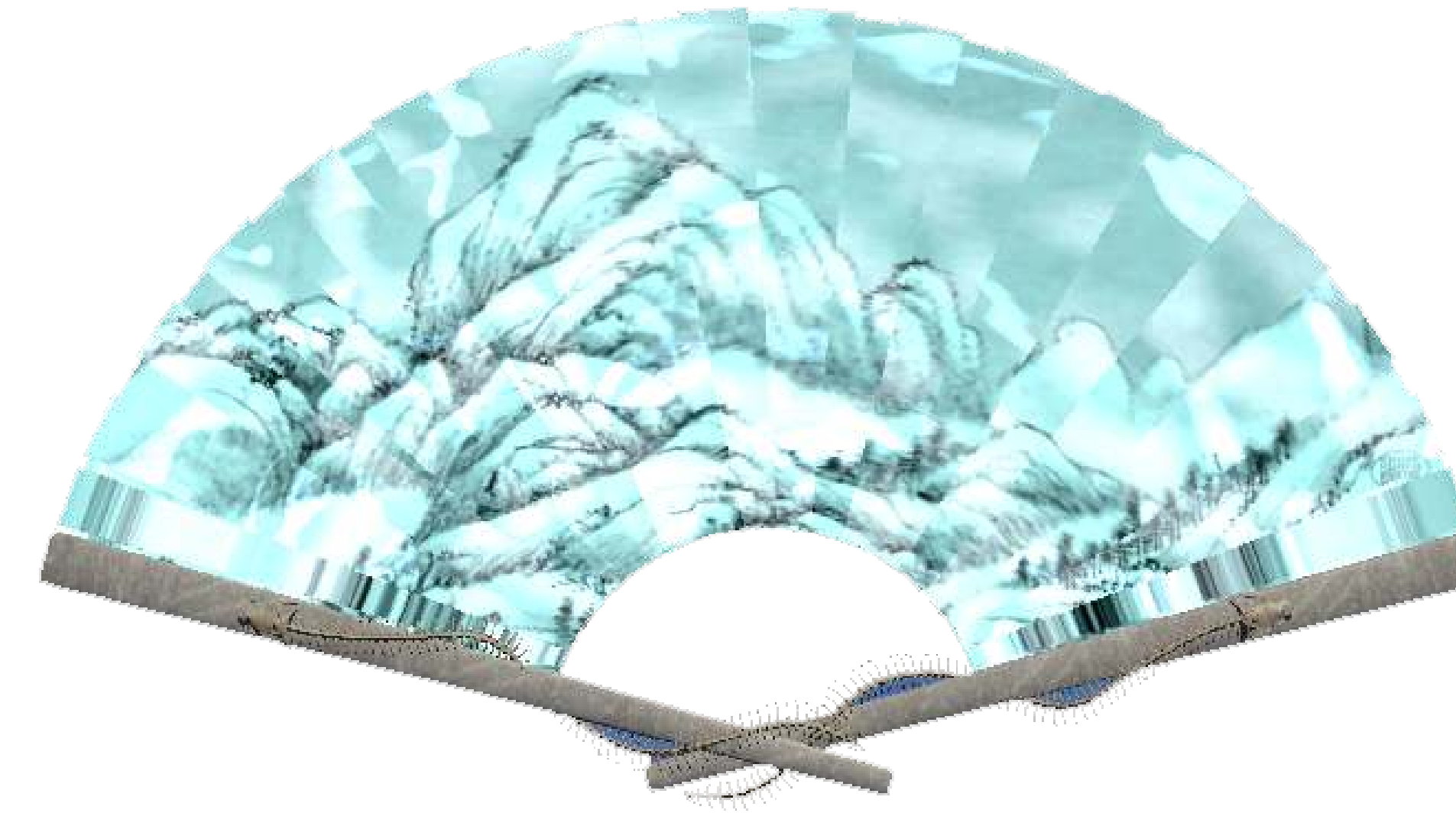


Fan of Autumn

Thinking of the Autumn Fan brings to mind one adorned with maple leaves. Its creation has two parts: growing the maple leaves, similar to the Spring Fan using a particle system, and the falling and withering of leaves. We employed a shader script to achieve a rim dissolve material, simulating leaf burn. The top-right image displays the rim dissolve effect, while the bottom-right image presents shader connections.

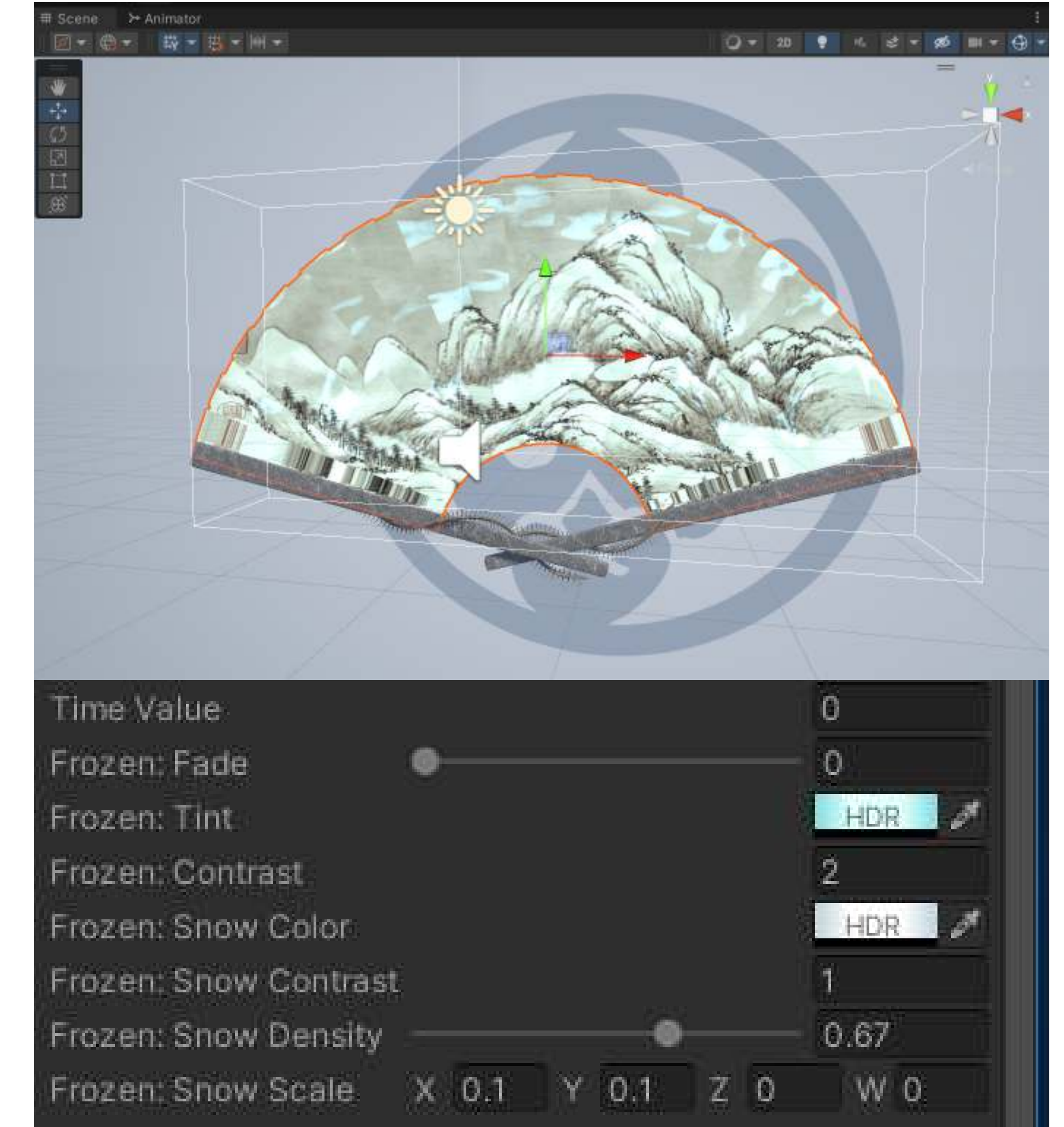


Autumn & Winter



Fan of Winter

The Winter Fan concept is simple: we wanted to make a freezing fan. To achieve this, we added an ice material over the original fan surface. By adjusting the material's opacity, we created a gradual freezing effect. The top-right image shows a partially frozen fan, and the bottom-right image provides details on the parameters involved.



AR EFFECTS

We employed the Unity library Vuforia for AR effects. Vuforia simplifies AR implementation by selecting recognition types, uploading images, and downloading Unity packages from its official website.

Live Demonstration



1. Detect

Open camera, point it at the target object. Vuforia will automatically recognize the target object, and once recognized, it will proceed to execute the following program.



2. Display

In our scripts, the model is displayed over the target object, maintaining a consistent spatial alignment, creating the illusion of it being present in the real world.



3. Interact

You can open and close the fan with the "Open/Close" button, and switch between models using the left and right arrow buttons.

Demonstration Screenshots

Check our demo video here:
<https://youtu.be/k5dn5lYgzTI>





Escape

First-Person VR Game Development

Duration 2 months

Year 2023

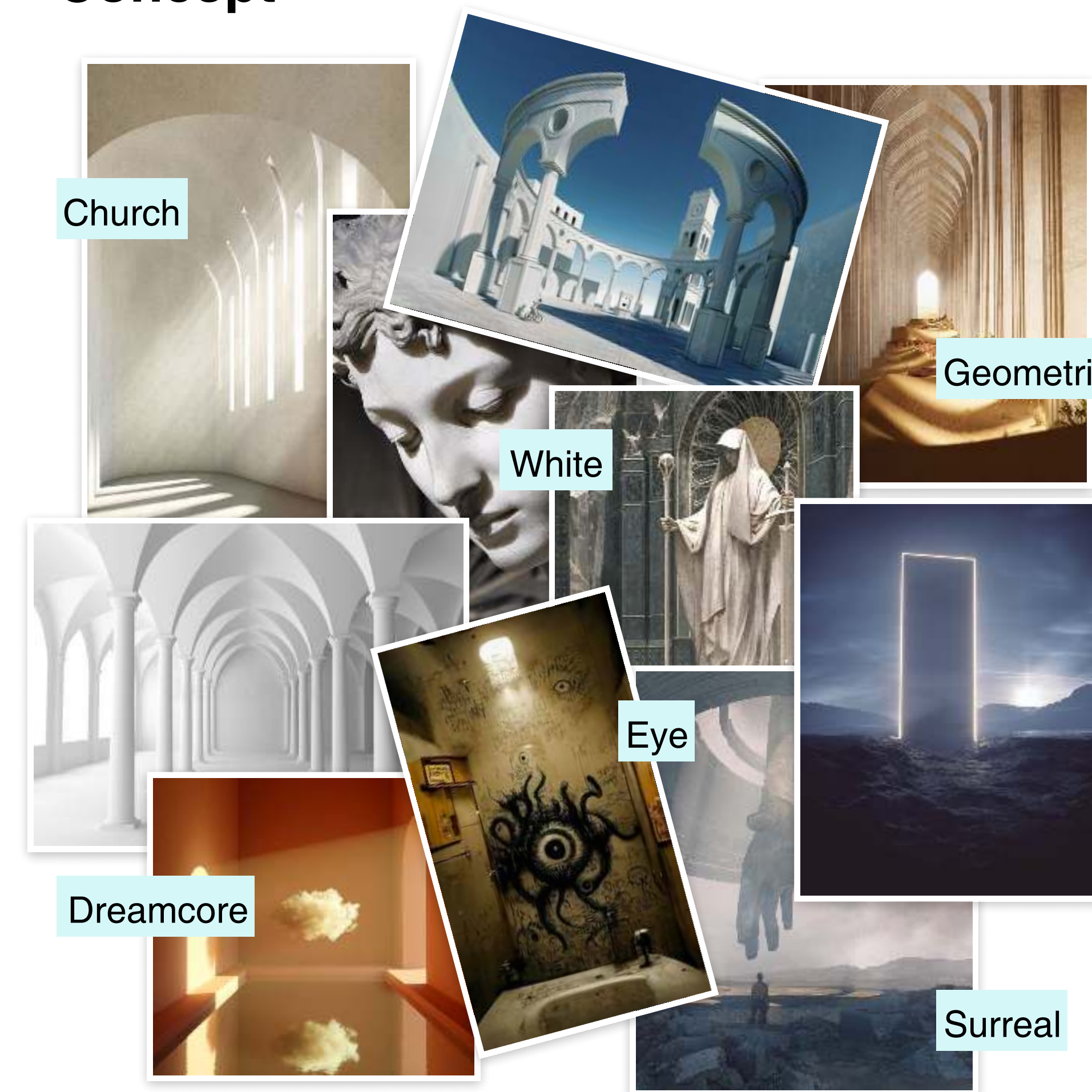
My Roles Game designer, story writer,
artist, programmer

Team Members Jiaqi Tan, Yunhua Tan, Jiaqi Zhang,
Liwen Yi, Yi Deng

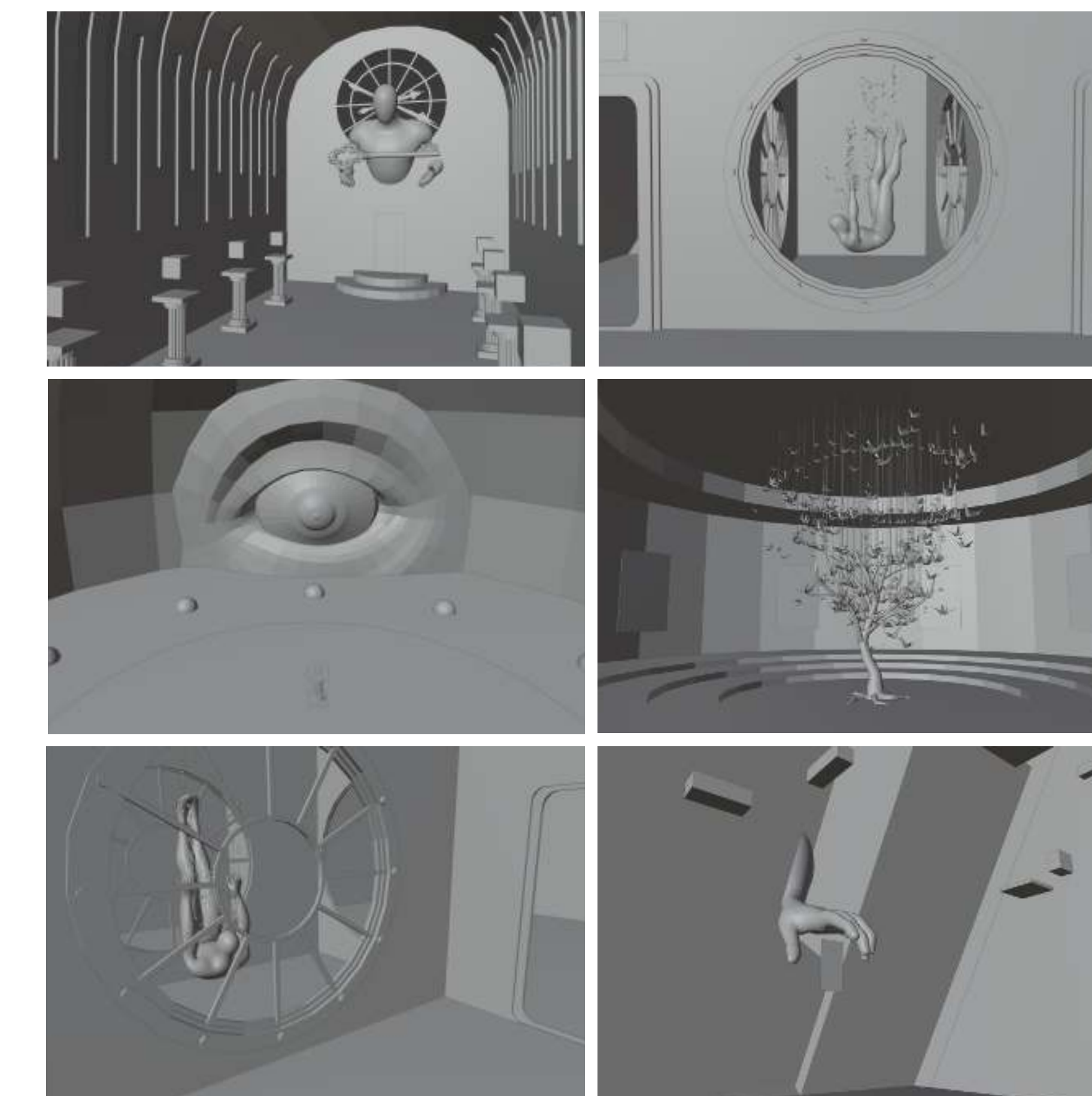
GAME ART

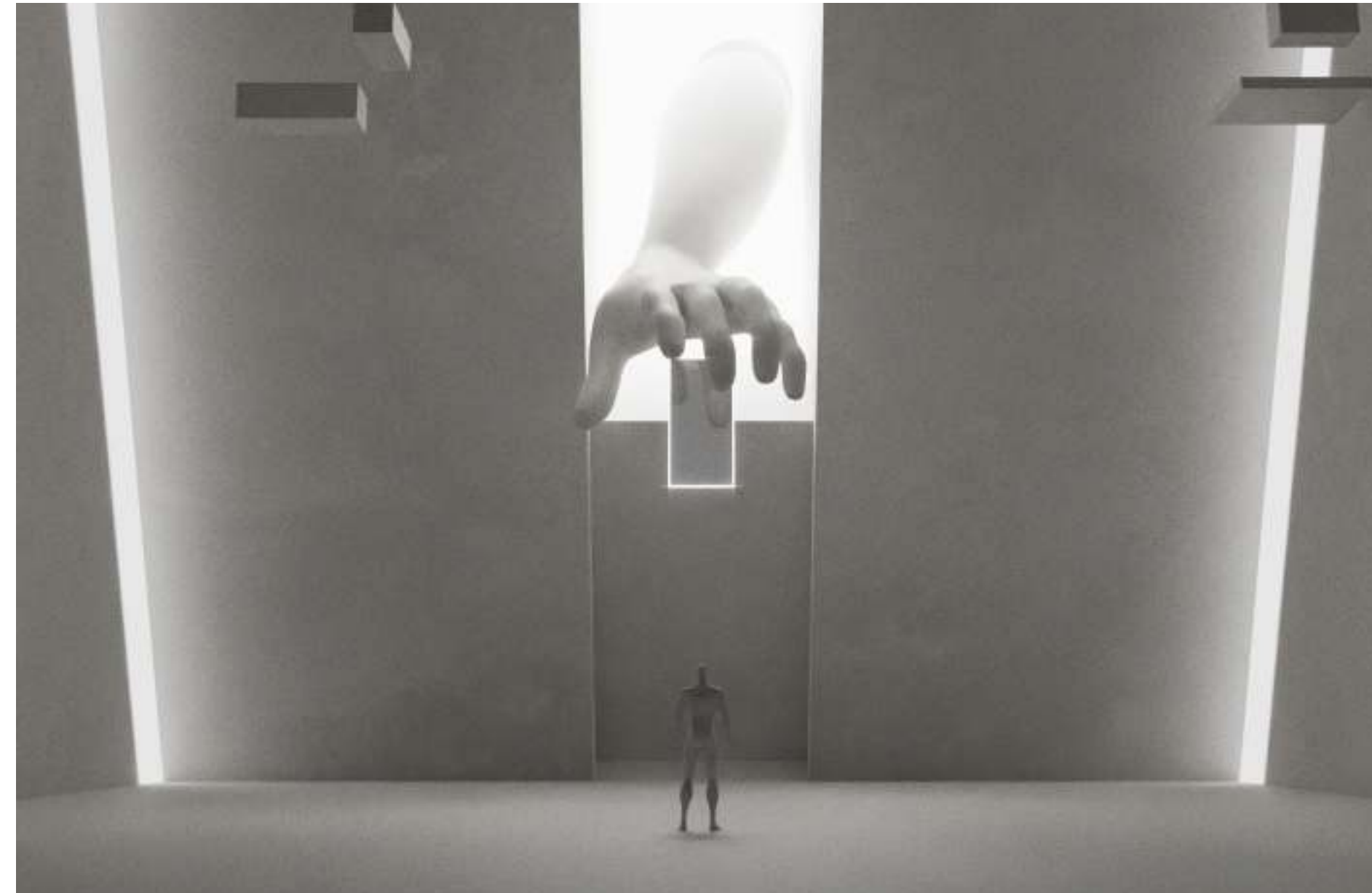
After storywriting, I began by analyzing the story and conducting initial concept design. Using these concepts, I crafted the game scenes in Blender, which will later be imported into Unity.

Concept



Grayboxing



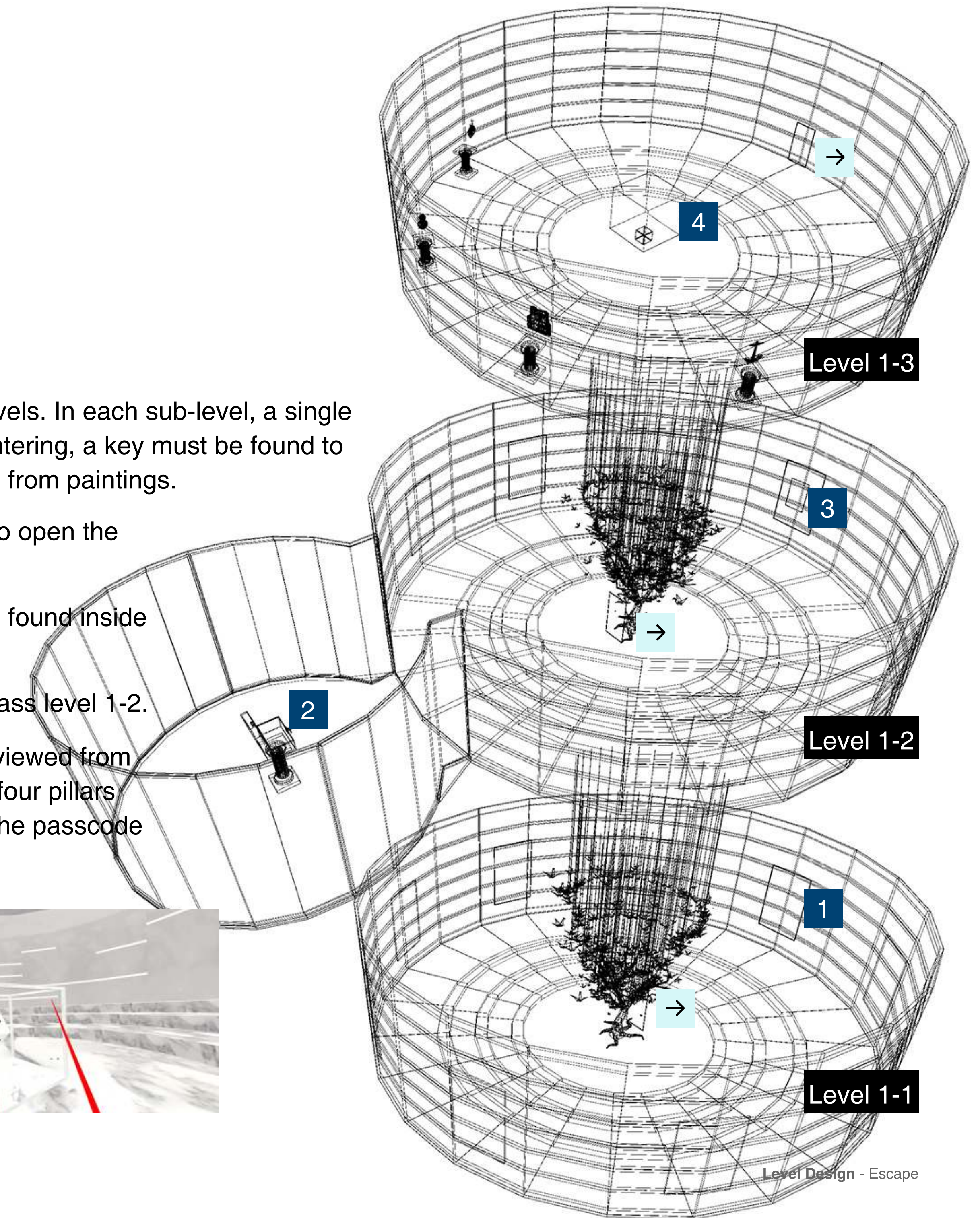


LEVEL 1

Gallery: The Key Inside Paintings

The first level is set in an art gallery, with three sub-levels. In each sub-level, a single door serves as both an entrance and exit, but upon entering, a key must be found to reopen it. The main gameplay involves retrieving keys from paintings.

- 1 Players need to extract the key from the painting to open the door of level 1-1.
- 2 The painting which had the key in level 1-1 can be found inside this box.
- 3 Put the painting back to its position and you can pass level 1-2.
- 4 This is an empty box that appears different when viewed from each of its four sides. By placing objects from the four pillars into the box and using deduction, you can obtain the passcode to clear the level.

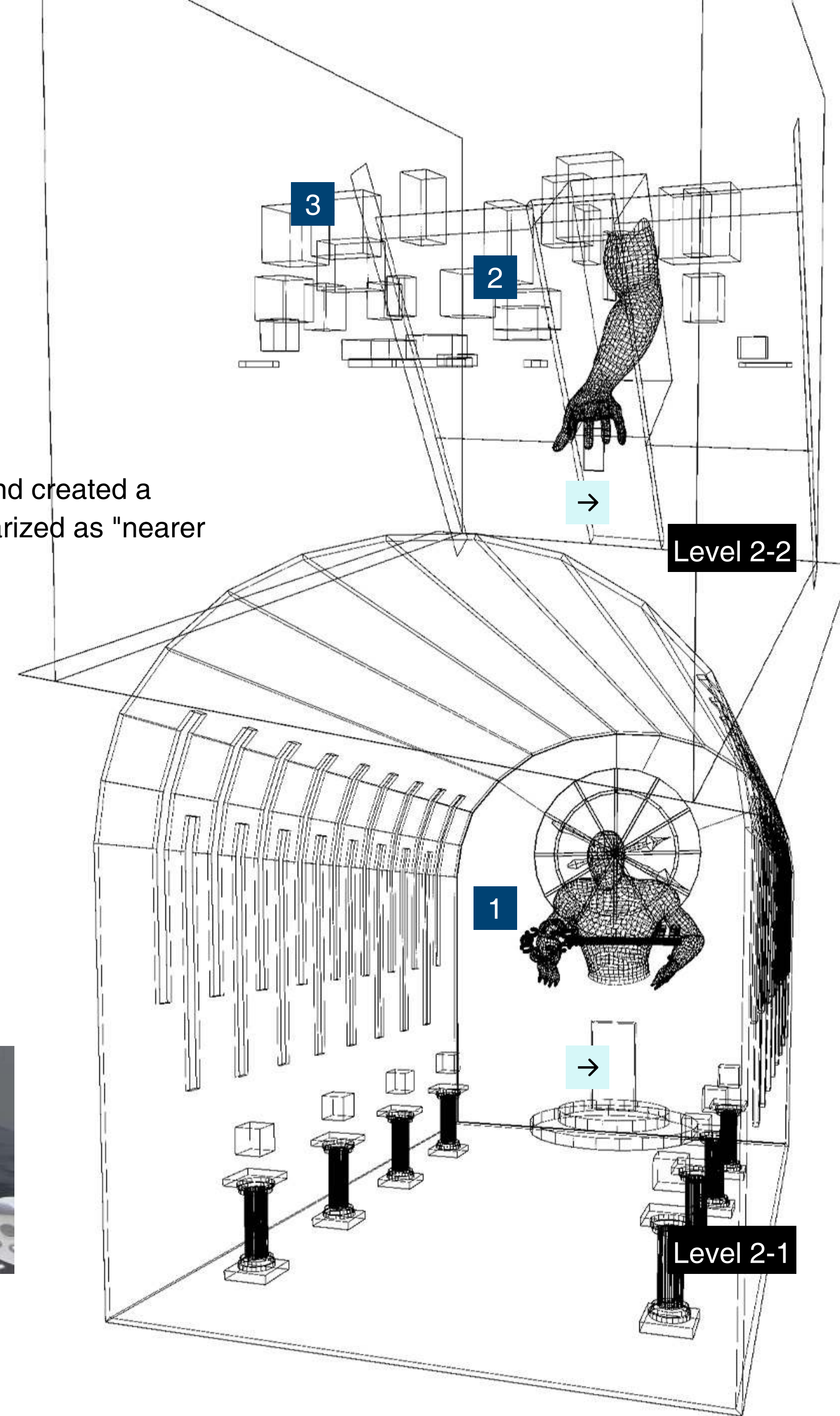
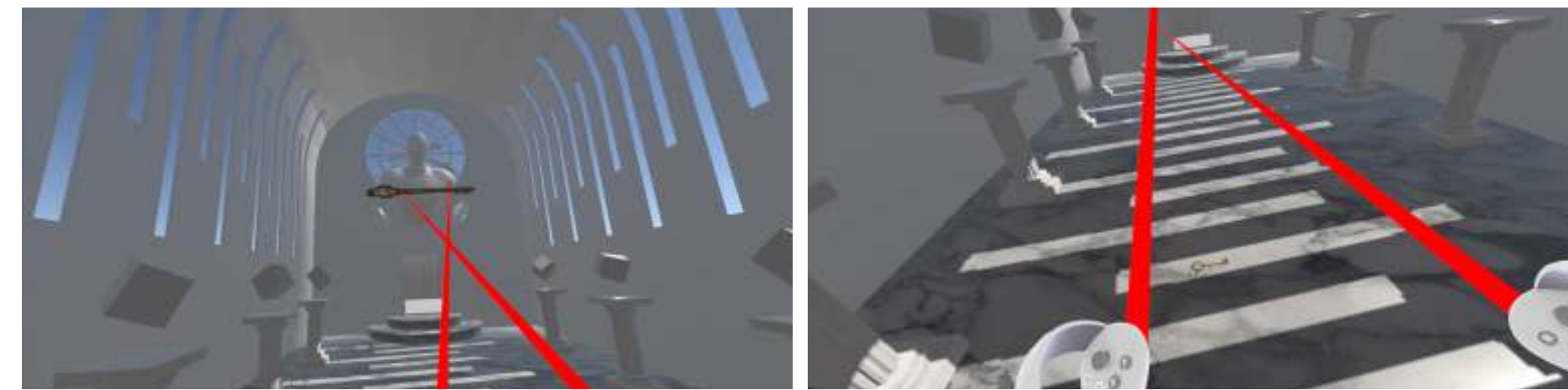


LEVEL 2

Church: Illusions of Depth and Perspective

In the second level, we drew inspiration from the game "Superliminal" and created a space that defies the rules of perspective. The gameplay can be summarized as "nearer makes it smaller, farther makes it larger."

- 1 This is a key that is excessively large compared to the door. Players need to attempt to make it smaller in order to open the door and pass level 2-1.
- 2 This space features floating blocks and a door suspended in mid-air. It is easy to think that we can take down these blocks and arrange them into steps to advance.
- 3 Another way to clear level 2-2 is for players to find the key concealed within. Once the key is reached, the space will flip 180 degrees, and at this point, the path to the door becomes straightforward.

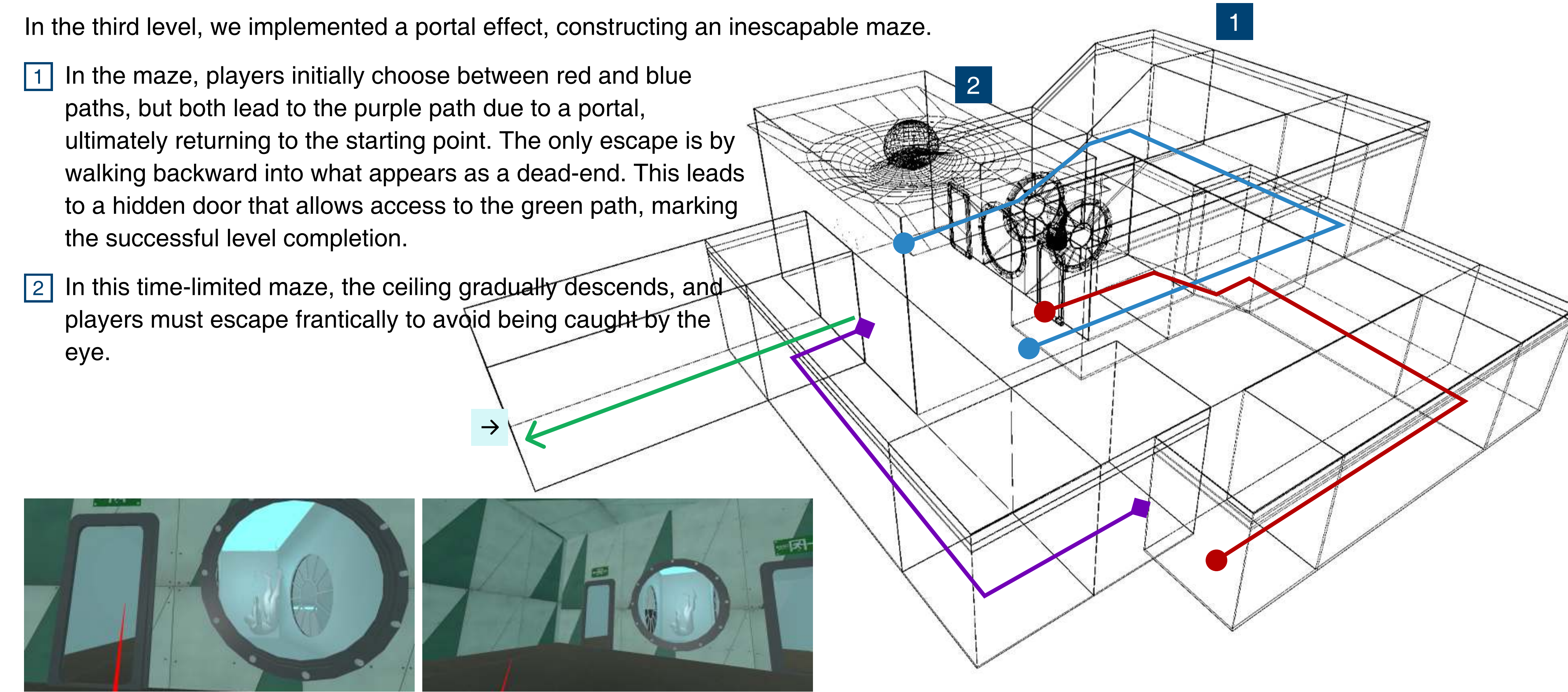


LEVEL 3

Ship: A Maze with No Exits

In the third level, we implemented a portal effect, constructing an inescapable maze.

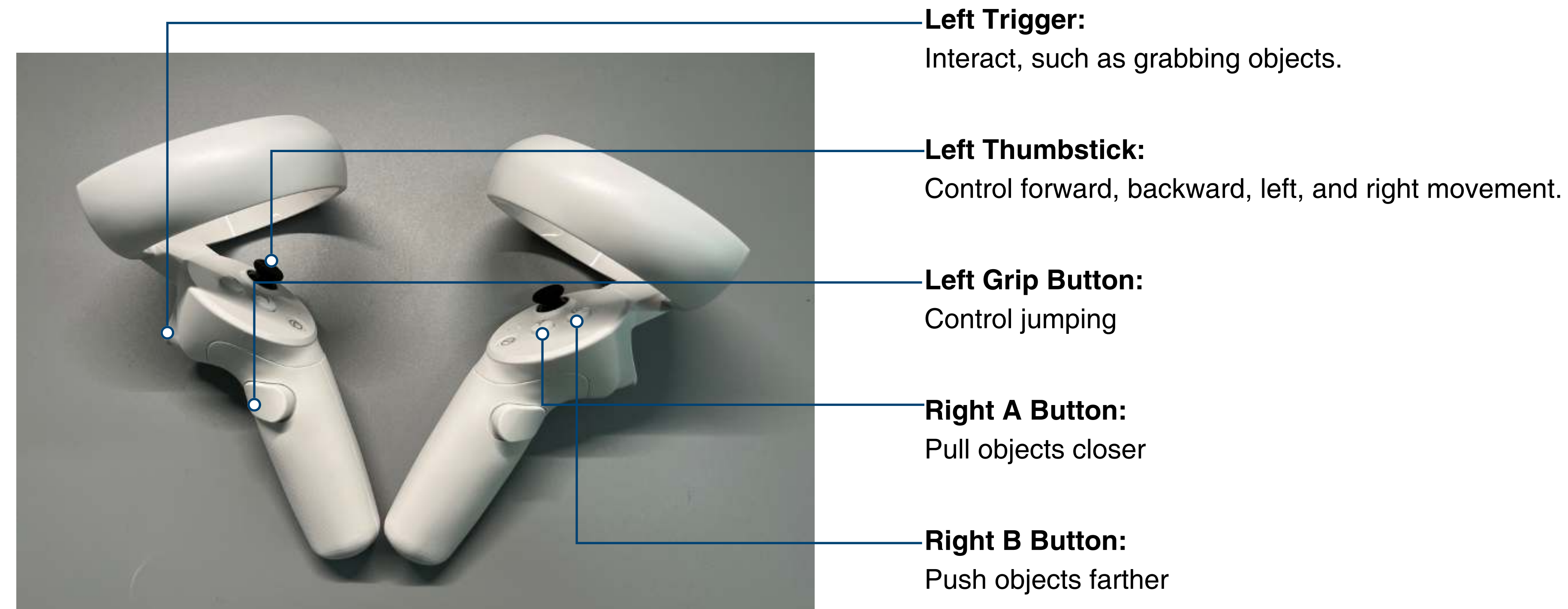
- 1 In the maze, players initially choose between red and blue paths, but both lead to the purple path due to a portal, ultimately returning to the starting point. The only escape is by walking backward into what appears as a dead-end. This leads to a hidden door that allows access to the green path, marking the successful level completion.
- 2 In this time-limited maze, the ceiling gradually descends, and players must escape frantically to avoid being caught by the eye.



VR GAME

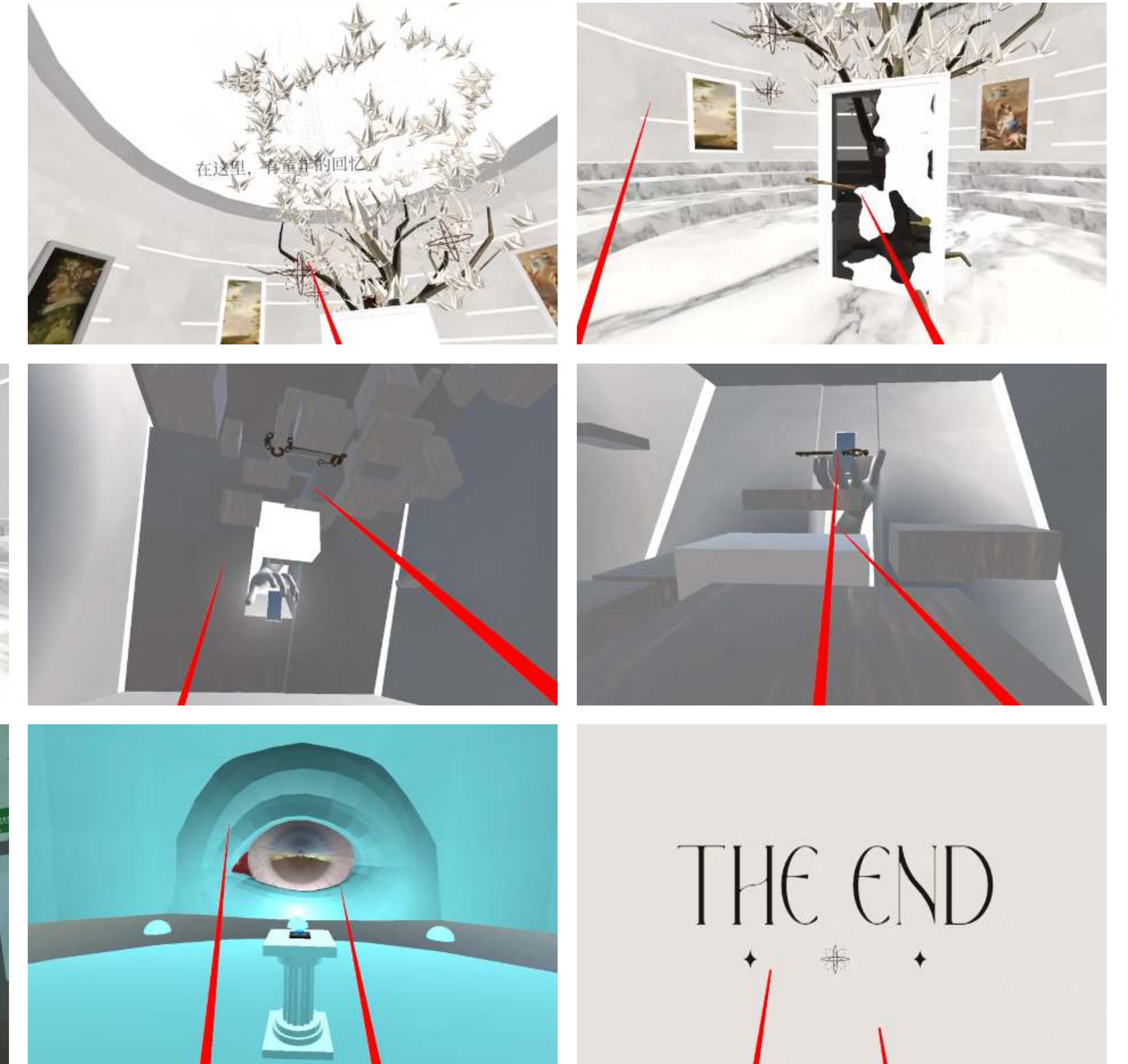
In the VR operation section, we developed based on UnityEngine.XR and the PICO SDK, summarizing the required actions and assigning key functions.

VR Controller User Guide



Demonstration Screenshots

Check our demo video here:
<https://youtu.be/mhrExDgRpAA>



THANK YOU

Jiaqi Zhang ————— 2023