

A hand-drawn sketch in grey ink serves as a background. It depicts a person's face with simple lines for the eyes, nose, and mouth. Below the face, there is a rectangular shape representing a suitcase or a bag, with some internal lines suggesting its structure. The sketch is partially obscured by the text and a horizontal line.

THREE DAYS

CAN'T SEE

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ZIHAO WANG

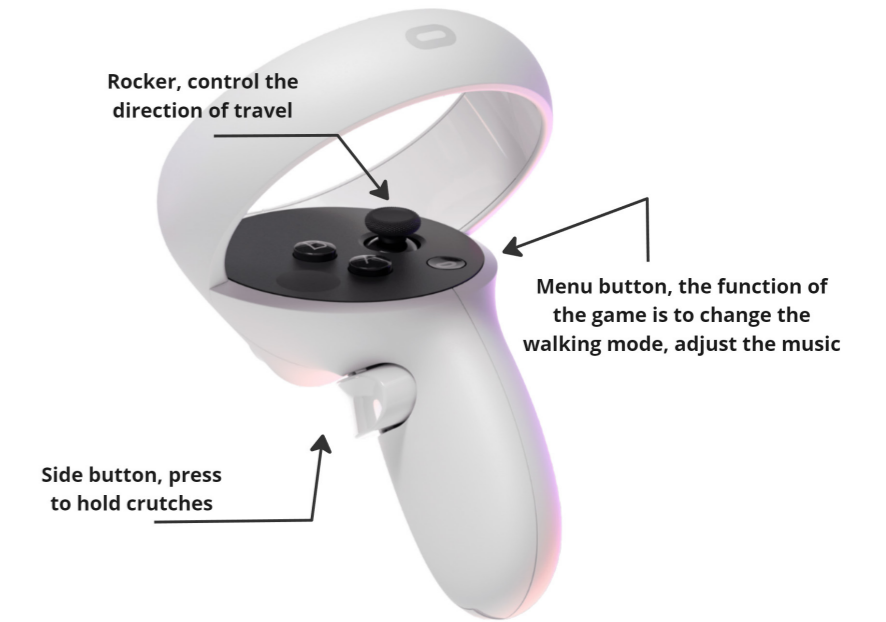
The picture of the cover is the starting point of the idea, and here is the end of the project.

**Here, you will play the role of a visually impaired patient, visual weakness, you need to cross a seemingly dangerous sidewalk, play your wisdom, avoid the pressure on the blind path of bicycles, in the blind path to eat angry people, and finally reach the end, come on, smart players!**

# Gameplay



At the beginning of the game, there will be a crutch in front of you, you need to take the crutch to walk along the blind road, then you will lose most of your vision, the world will become blurred in front of you, you need to use the crutch to find the location of the blind road, when your crutch contact the blind road, the corresponding brick will glow, you need to follow the guide of the blind road, walk through this section of the road. The game video can refer to the video demo.



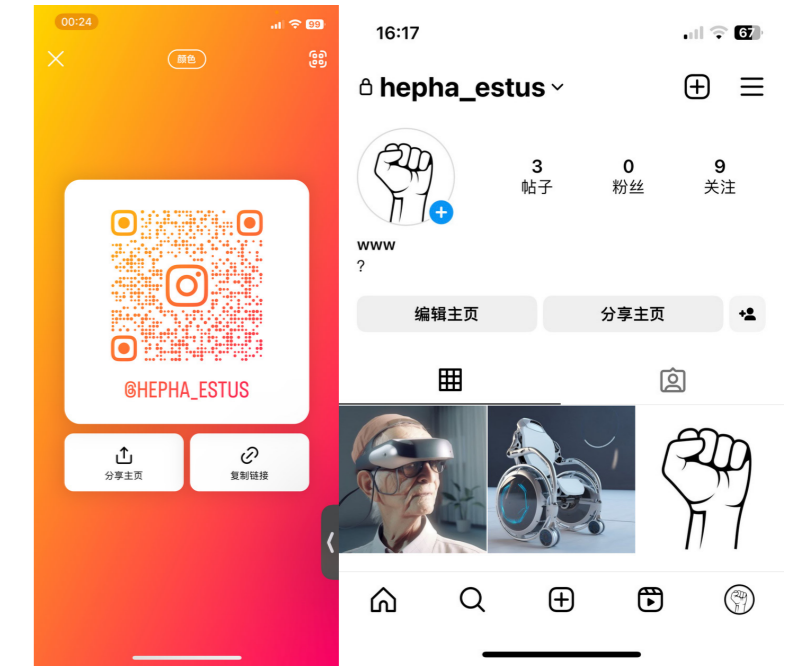
# DEMO

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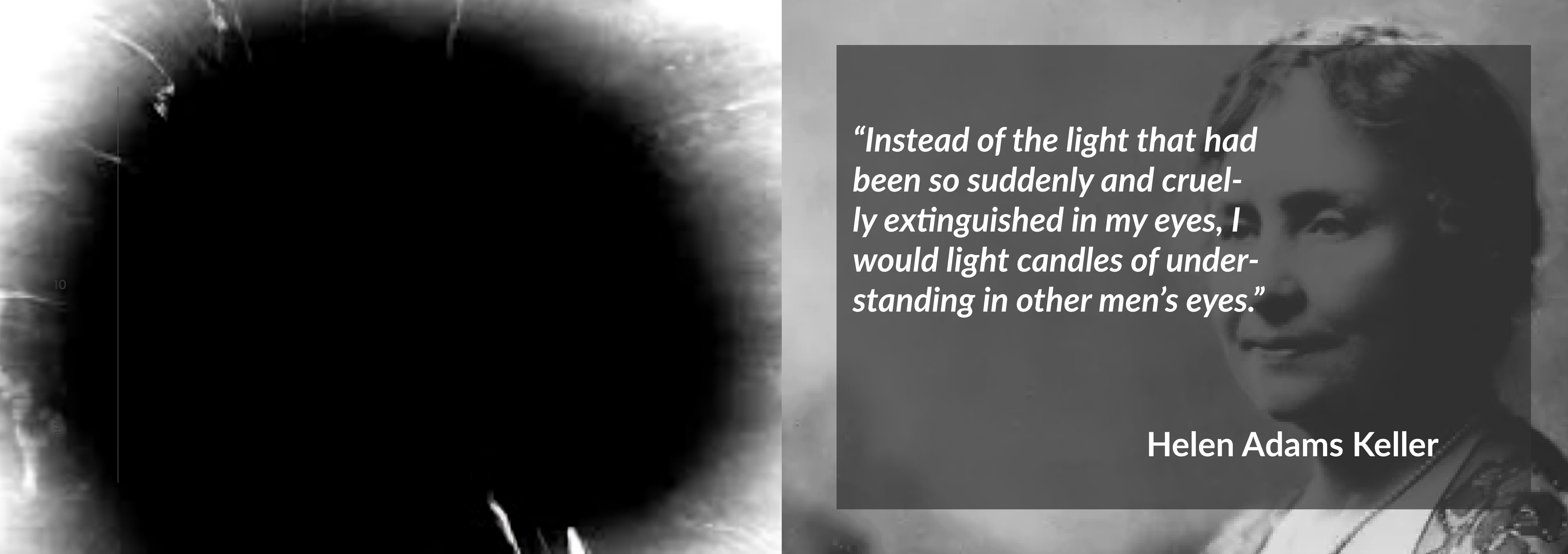
# Preface

Strictly speaking, I started to pay attention to the disabled in my sophomore year. In my sophomore year at COLAB, I founded my disabled care company Hephaestus, dedicated to improving the quality of life of the disabled and the elderly. In November 2023, I applied for registration of this company and named it CR TECH. In the first project of my junior year, I made a robot that provided substitute for people who could not travel, and my final thesis was also related to disabled people. In this project, I hope that



through the games I make, people can realize the hardships of the life of the visually impaired among the disabled, and I hope that the society can give them more attention and support.





*“Instead of the light that had been so suddenly and cruelly extinguished in my eyes, I would light candles of understanding in other men’s eyes.”*

**Helen Adams Keller**

Don't be afraid, these or dark or blurred pictures are the pictures that people with visual impairment can see in life. For them, these images are just everyday life. Before we start the whole project, I think we need to understand the current situation of people with disabilities.

## ABOUT THE VISUALLY IMPAIRED

Globally, at least 2.2 billion people have impaired vision or are blind, with at least 1 billion of these cases being preventable or yet to be addressed. Key causes include cataracts, myopia, hyperopia, and glaucoma. Factors such as aging populations, lifestyle changes, and limited access to eye care services are the main reasons for the increasing number of people with vision impairments.



## About the people with visual impairment in life by the trouble

### Discriminate against



No.1

Suffer discrimination from others



No.2

Unable to get help from others



No.3

Unfriendly policies, such as banning guide dogs from buses

### Work and income



No.1

Low income



No.2

Family abandonment



No.3

Unfair treatment

### The harm it brings



66%

Feel hard to live



54%

Exhaustion



29%

Depressed



27%

Bodily injury

- Q1 Have you ever felt singled out or discriminated against because of your visual impairment?
- Q2 How did these experiences affect you? How do you deal with these challenges?
- Q3 How do you think society should improve its support and understanding of people with visual impairments?



A1

Sometimes on the bus, even though I was wearing a visible visually impaired sign, it was difficult for someone to offer their seat

A2

These experiences make me feel frustrated and marginalized. I tried to join the visually impaired support group, communicate with the same conditions, find empathy, and learn some strategies.

A3

To provide legal assistance and advice to visually impaired people, especially in cases of discrimination and unfair treatment, to help us defend our rights and interests.



A1

When applying for a job, some employers have changed their attitude after learning about my eyesight.

A2

This experience made me feel that society's understanding of the visually impaired is still very limited.

A3

I think the important thing is education. Schools and public education programs should include lessons about the visually impaired to educate people on how to communicate and interact with the visually impaired and how to help.



A1

In social situations, people often assume I can't participate in conversations or events, which makes me feel isolated and misunderstood.

A2

I learned to be more proactive in communicating my needs to people, which helped me build more of a support network.

A3

Public places need more accessibility, such as voice prompts and tactile guidance systems, which can help visually impaired people move more independently.



A1

In the supermarket, I need help finding items, but sometimes employees see me using a white cane and they show impatience or try to avoid helping me.

A2

The experience made me feel like a burden, but I tried to tell myself it was because of their lack of understanding. I get involved in community activities and try to show that visually impaired people can be as active and capable as anyone else.

A3

The government can provide more financial assistance for the purchase of necessary auxiliary devices such as electronic amplifiers, smart watches, etc., which are essential for our independent lives.

# Questionnaire & Interview

As early as in the CoLab of year2, I started my research on PWD(disabled person), and all my subsequent projects and papers have been focused on PWD, so I think I have a sufficient understanding of PWD. But I think it is not a good thing to be too conceited, and I have never deeply understood the detailed fields of PWD, such as visual impairment, hearing impairment and so on. So I think I need to dig deeper. Subsequently, I found 10 visually impaired patients in the UK and 40 visually impaired

patients in China through my elders in the domestic medical system and my home in the UK, and conducted a questionnaire survey, and interviewed 2 visually impaired patients in China and 2 visually impaired patients in the UK. In general, the situation of people with visual impairment is similar in large cities in the UK and China, while the situation of people with visual impairment in rural and backward cities in China is more difficult. In terms of difficulties encountered,

discrimination and lack of access to help dominated. For example, in front of a zebra crossing where the sound system of a traffic light is damaged, the blind have waited for a long time to dare to cross the street, or in front of a container, the blind have fumbled for a long time without anyone to help. This project tries to make everyone feel the same, the effect may not be large, but it is also good to increase the attention of the blind.



# The 4 Years

2000-2024

2023



## HANGZHOU

Hangzhou, my hometown, is also a very young city and the computer capital of China. However, due to its too young age, Hangzhou is too backward in terms of transportation planning, narrow commercial streets, and a large number of blind roads are occupied. But who can blame it? Who would have thought that Hangzhou could go from a village to the fifth largest city in China in 20 years.



## SHANGHAI

Shanghai is the second city in China, in the downtown area, traffic management is very strict, occupying the blind road is not allowed, but in the suburbs, many commercial activities still exist.

2023

2023

In recent years, I have been paying attention to the problem of blind path occupation and have done a lot of research. Here are the four cities where I think blindness has taken its toll the most.



## SUZHOU

Jiangsu is a close way from Shanghai, and over the years, it has undertaken some industries that were eliminated in Shanghai, so it has developed rapidly. Transportation planning in Jiangsu is difficult, because there are too many ancient buildings here, people have to plan a lot of strange roads in order to protect these buildings, and the construction of blind roads is naturally ignored, here, you will always find a wall at the end of the blind road.



## Your Title Here

Nanjing is the city with the most serious problem of blind roads that I have observed. Bicycles, motorcycles and other means of transportation are very popular in this city, but the municipal government has not implemented strict regulations on non-motor vehicle parking, which leads to the occupation of blind roads.



In Europe and the United Kingdom, the problem is repeated. The two pictures on the left are from Rome and London, and it is understood that Rome's urban planning was too early, so that the blind road is not well compatible with modern architecture. In London, there are so many activities that blind paths have to be occupied.



21HAC  
In the summer vacation of 2023, my friend did a very interesting thing, he is an Internet celebrity, often uploads some funny videos, similar to youtubers. It's called If I were Blind,

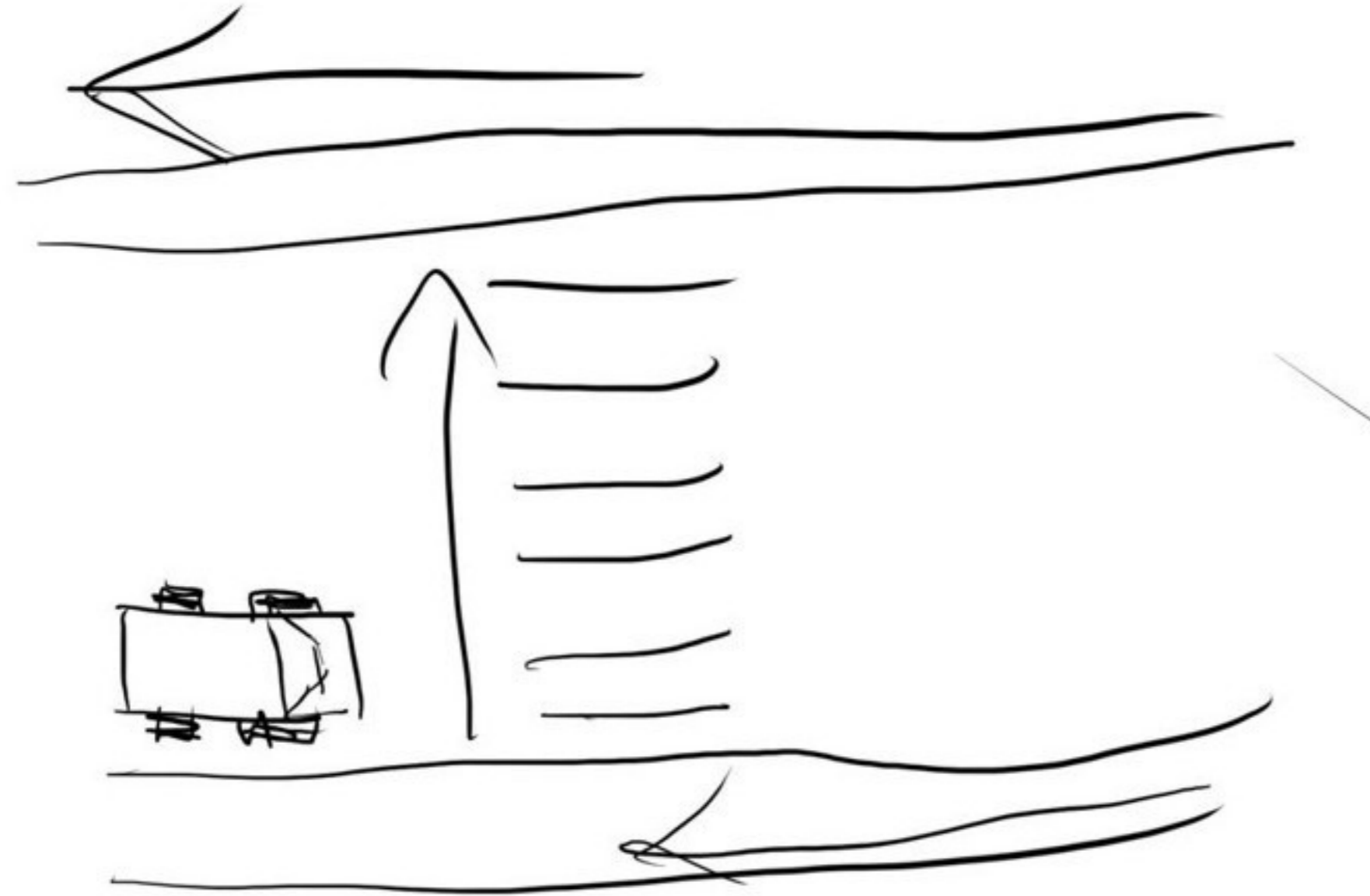
and it's a way to test how difficult it is for blind people to travel and whether they face discrimination. It was

gratifying that the vast majority of people gave us a helping hand, and some even offered to drive us all the way home, which made us feel warm. But we also found a lot of inconveniences, such as motorcycles blocking the blind path.

# Social activity

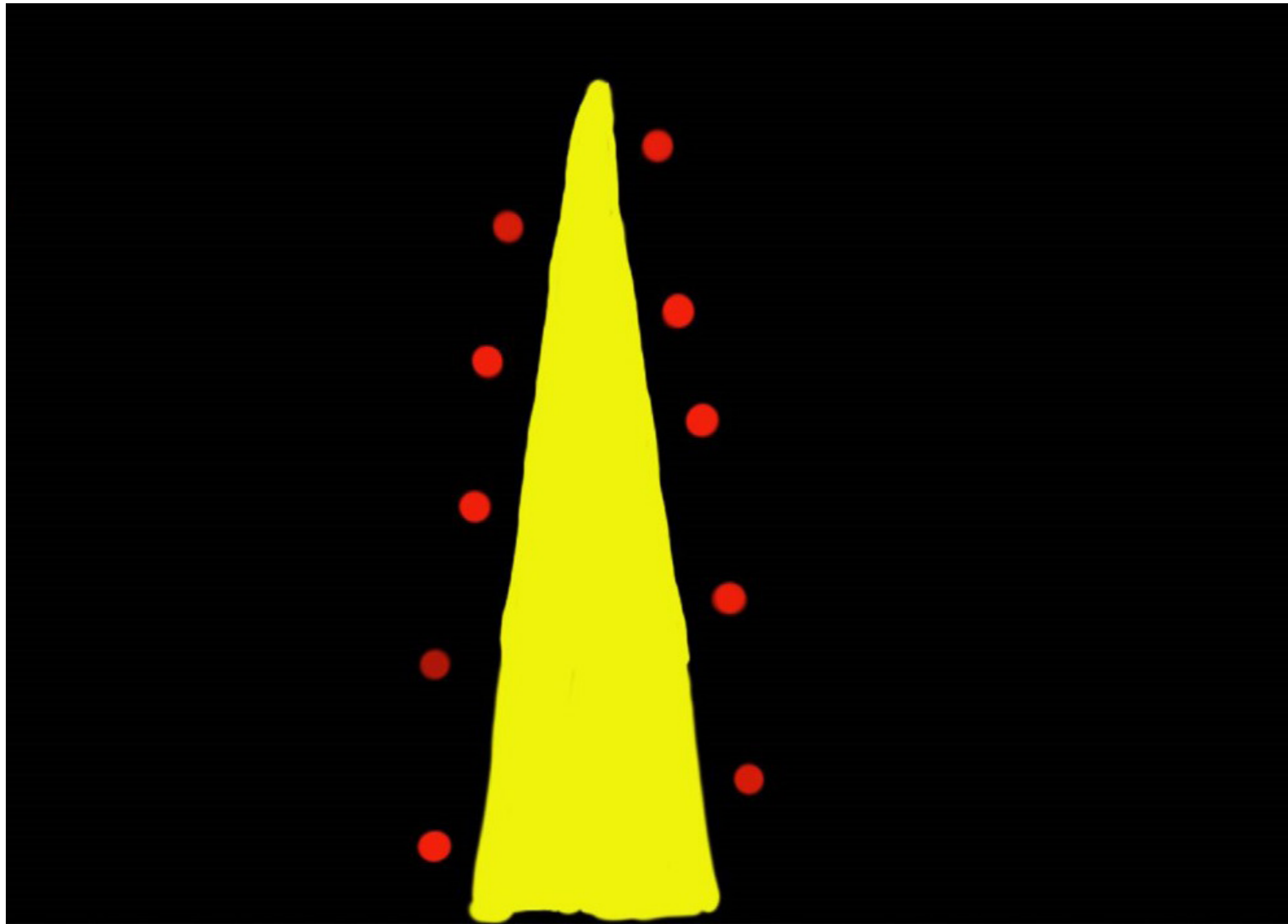
# First draft

At the beginning of the project, I was not good at drawing, so I chose to use collage to show my ideas. In this way, I think I can better express my ideas and get suggestions from others. I put together a collage of blind paths, scaffolding, debris, bicycles, cars, and so on, and here I showed my initial idea.



# Second draft

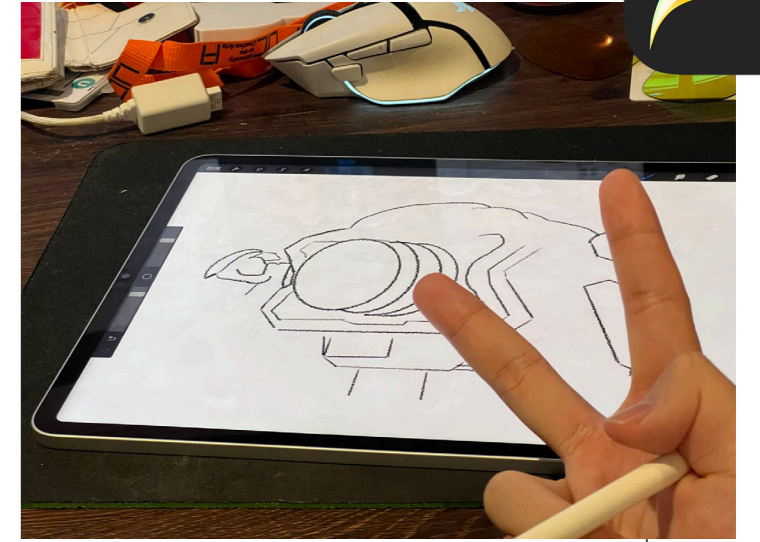




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During the discussion with my friend, he told me that I could use Procreate to draw directly on the photos, and then delete the pictures after drawing the general outline, I could get a similar draft drawing, and then I could make some creations based on this draft drawing. Although this technique did not significantly improve my drawing skills, But it allows me to at least use the sketch to show my ideas.





Here is the research on the streets of China and the UK. It is difficult for me to create a street out of thin air, and since I want to integrate the streets of China and the streets of the UK, I conducted research on the main cities of these two countries.

# WHY HONG KONG

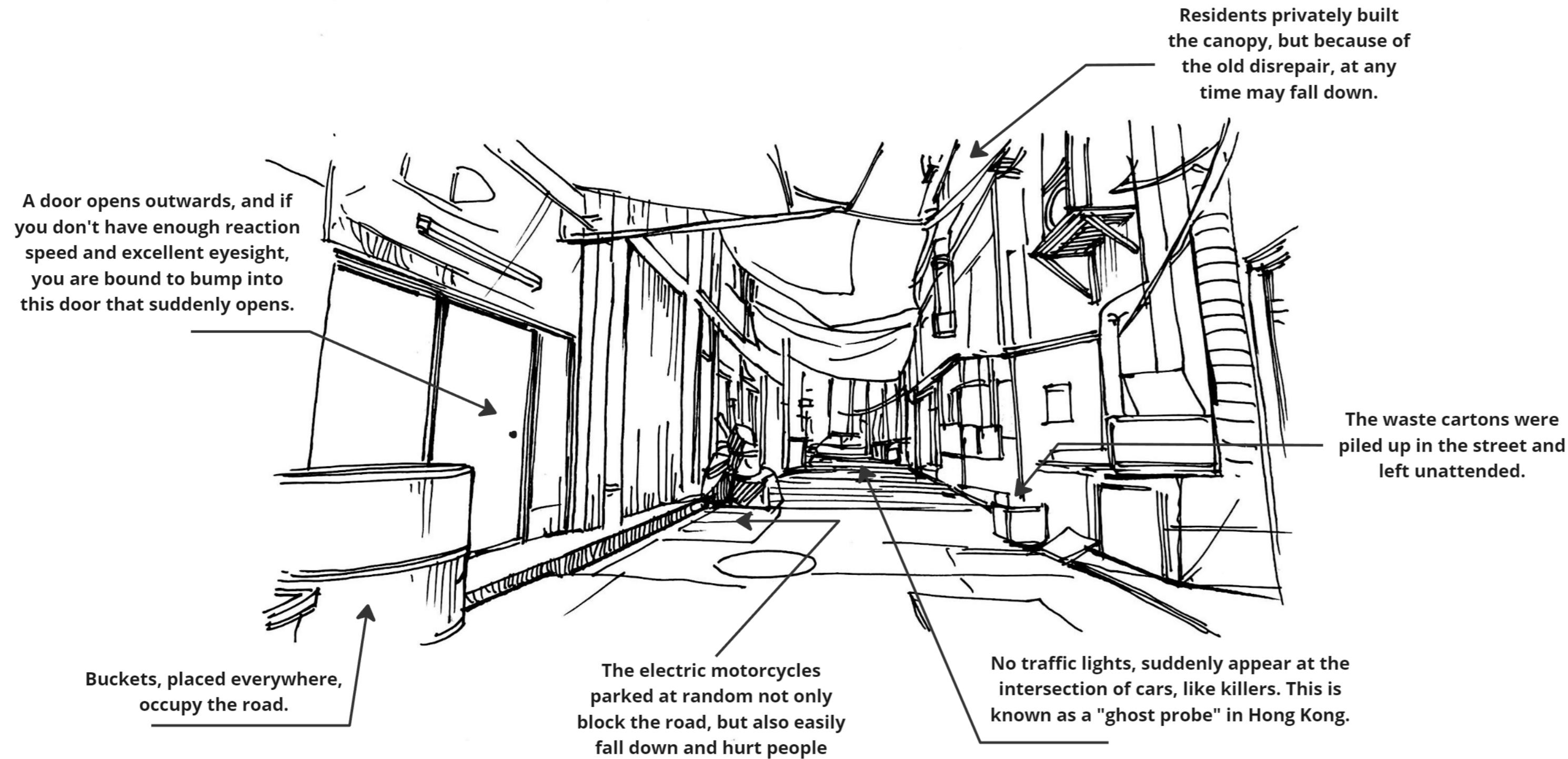
In this project, I have done a lot of research on visual impairment patients in China and the UK, and my interviewees and questionnaire respondents are also from China and the UK. Therefore, I hope to present the plight of Chinese and British patients with visual impairment in my works, and my game is mainly aimed at Chinese and British people, so I hope to make people in these two countries have a familiar feeling in this game, so as to help them better understand

the hardships of patients with visual impairment.

In the end, I chose to use the streets of Hong Kong as the basis for constructing the whole scene, because in Hong Kong, Chinese culture and British culture are well blended together. The overall architectural style of Hong Kong is Chinese, traffic rules, traffic lights and the sound of traffic lights are all adopted by the British, and the characters on the traffic signs are both Chinese and English.







This is the first draft of the streets I imagined. I imagined a completely backward city without humanistic care, where the residents were of low quality, and the streets were dirty and full of danger. But this idea is only in the rough draft.



The temporary shops set up on the street take up a lot of space.

During business hours, tables and chairs are moved to the blind path, blocking people from walking.

The street lamp very close to the blind path fully reflects the unreasonable design.

This is a sketch I made after looking at some European street models, and I added some elements based on the European streets provided by EVERMOTION, such as dining tables occupying the sidewalk, telephone poles too close to the blind path, etc.

# The choice of control mode



First of all, I think of reality moving. The so-called realistic movement refers to the distance that the player moves in reality as much as the distance that he moves in the game. But after research, I think there are many difficulties in this way. First of all, using this method requires a lot of space, my game envisioned the action distance is 100 meters, the width is 50, but it is difficult to find a 100\*50 field in the indoor space. Secondly, this control method is also very dangerous, because wearing vr equipment, so can not see the surrounding situation, there may be collisions, falls and other situations at any time, the need for someone to care for the site is very high, of course, this is easy to do regardless of the cost, such as in the exhibition hall or museum.

In the end, I chose to use the remote sensing on the gamepad to control it, just like a normal game, low cost and high efficiency.

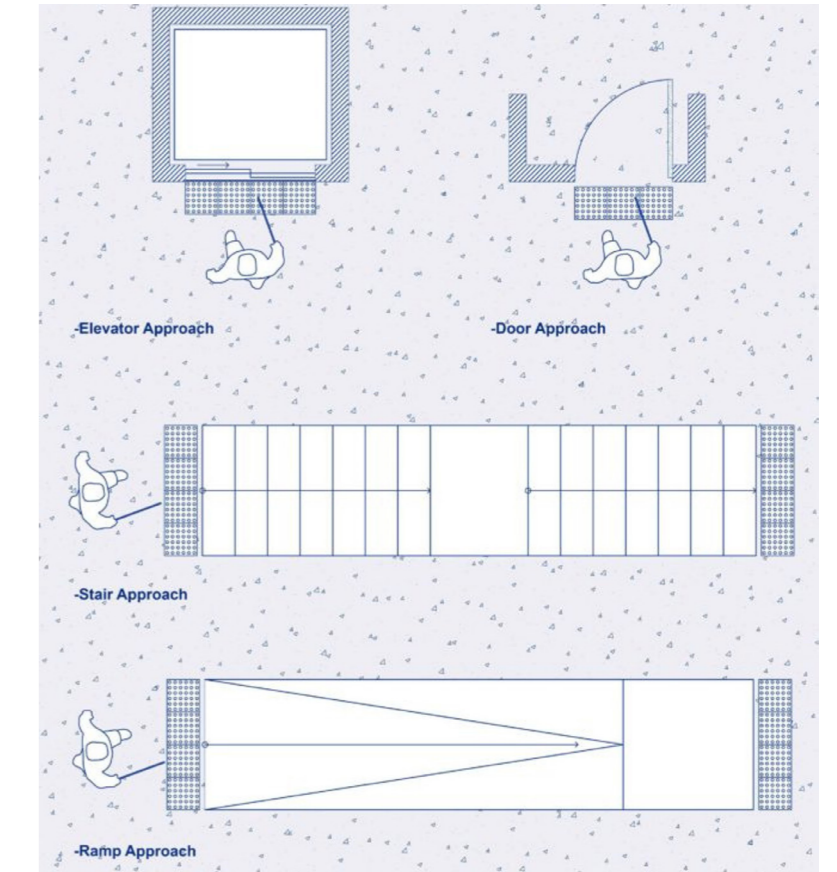
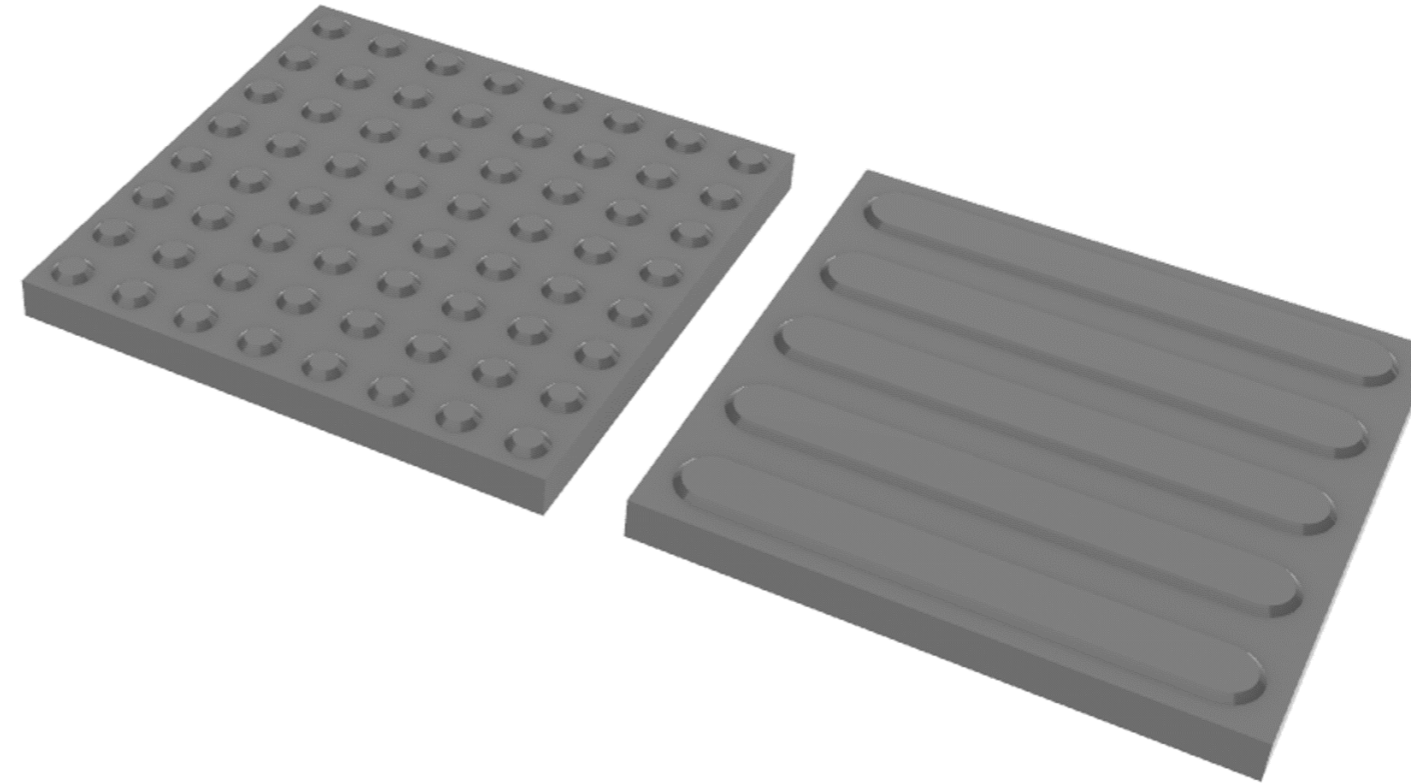
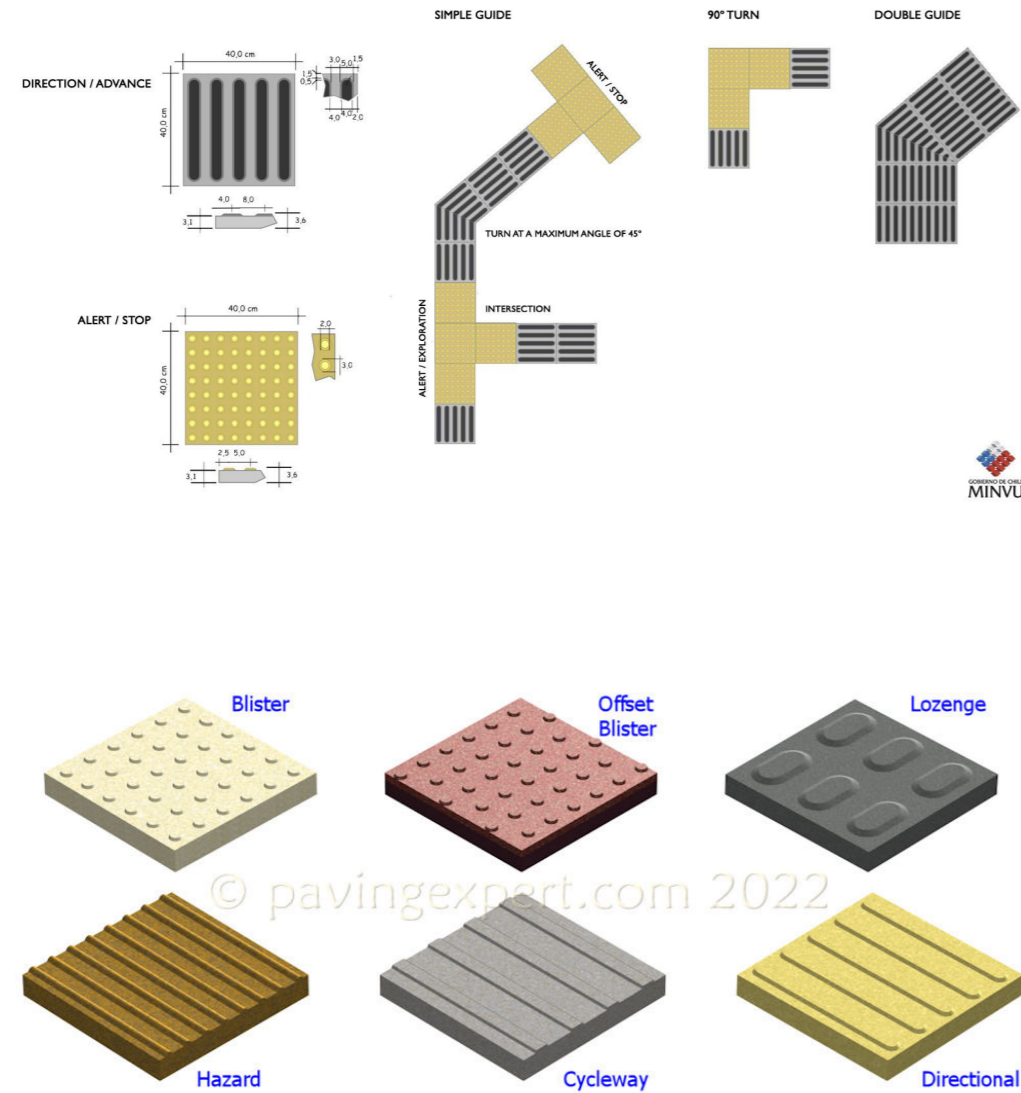
# Tile

In real life, there are only two common blind bricks, that is, dots and bars, meaning alert/stop and direction/advance respectively. These two types of bricks make up 90 percent of the blind spots we see on the road.

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ZHAO

In fact, there are six blind road bricks in the UK, and they have different meanings.



These special bricks usually appear in special scenes, such as train stations, subway stations, museums and other areas.

Finally, after completing my research, I modeled the two most common types of bricks.

# Stick

01

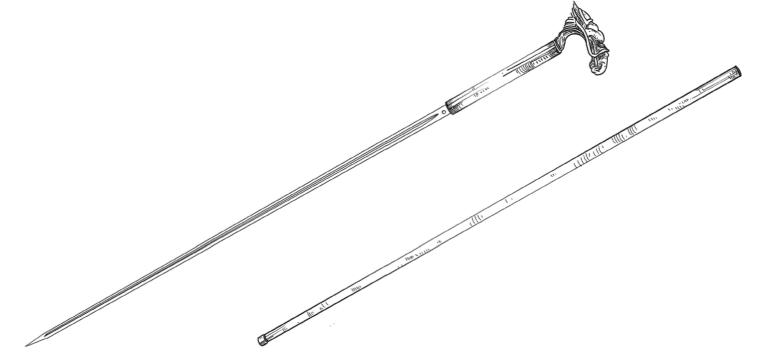


03



05

One-handed sword



After the selection of control methods, I began to conduct research on crutches. Crutches are divided into many types, including crutches for the blind, walking aid crutches for the disabled, gentleman's cane with greater decorative significance, and the one-handed sword hidden in the crutches as a weapon in legend.



I wasted a lot of time here, I wanted to use every button on the quaset2 handle, so I tried to make the crutch very complicated. After that, I started making games in UNREAL.



# Acquisition of material

I want to tell you about a very important package of materials that I used in the project: Archmodels for UE5 vol. 8. This collection of assets provides a complete urban area for my urban scene, including 50 complete urban buildings and hundreds of small elements such as trees, road signs, restaurant gardens, lampposts, newsstands, bus stops and bicycles, which greatly enhance the authenticity and vitality of the city.

Not only that, this material pack also contains 33 parallax OSR maps for store displays and the interiors of glass office buildings, where fully equipped interiors can be seen through glass Windows, adding a sense of depth and making the interiors look very realistic.

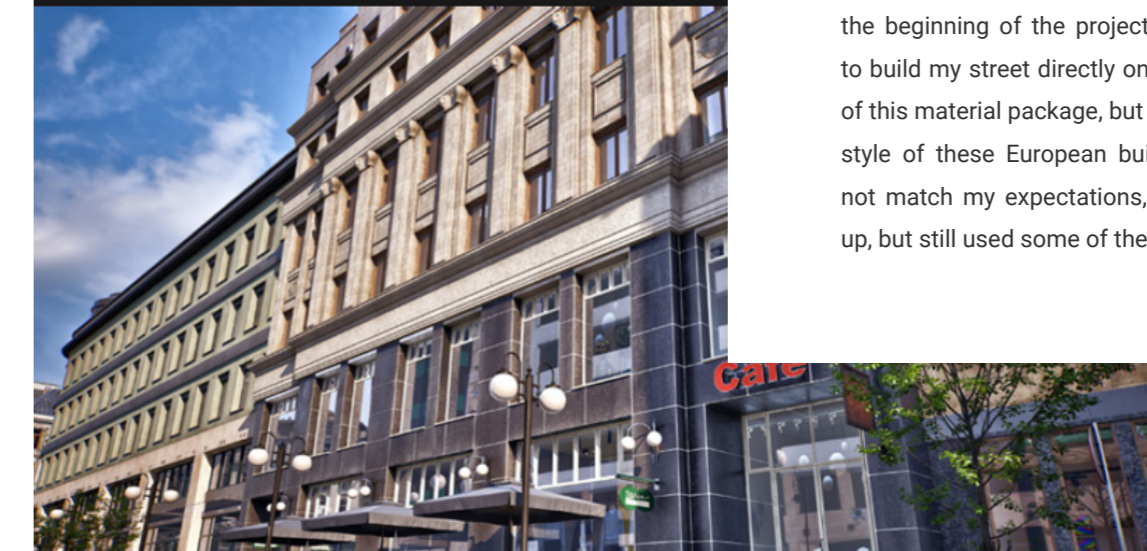
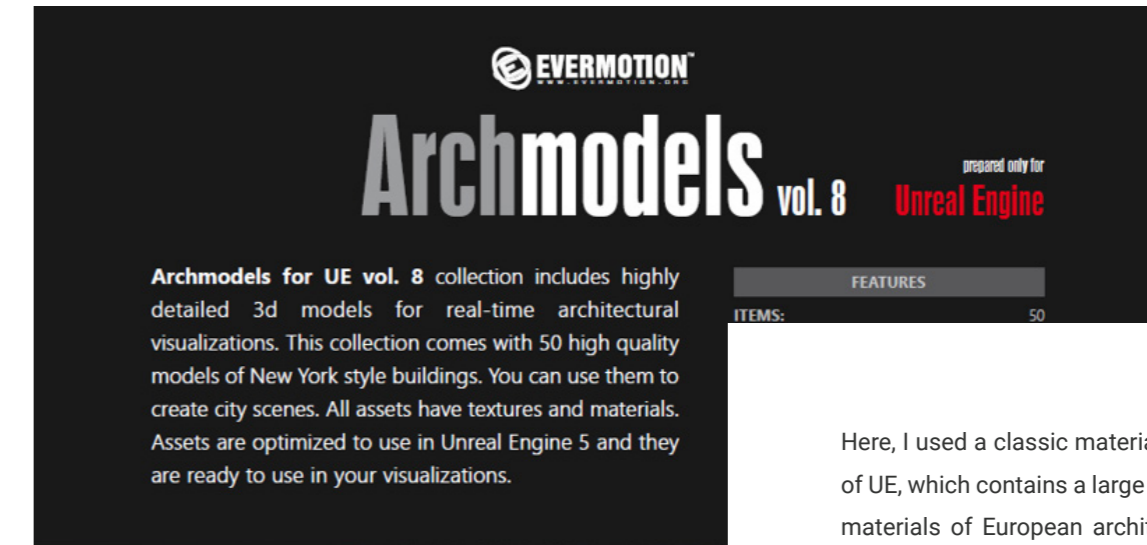
In terms of quality, the collection contains 900 shaders and 2,044 textures (156 of which can be tiled), most of the objects have been converted to Nanite, and the scene uses virtual textures to ensure smooth performance.

Overall, this collection provided great support for my project.

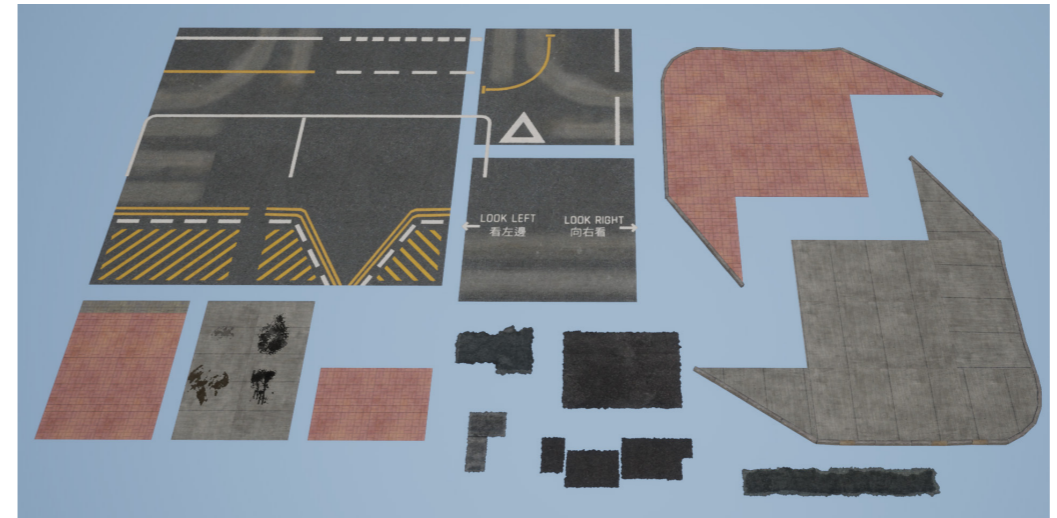
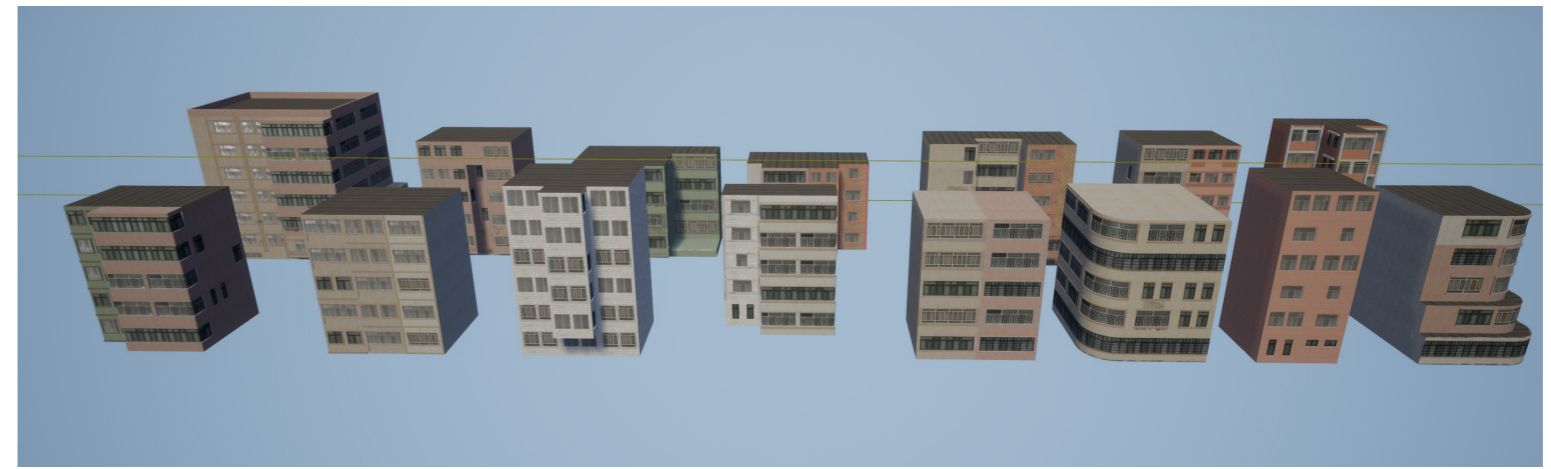


## EVERMOTION Arch

### Models

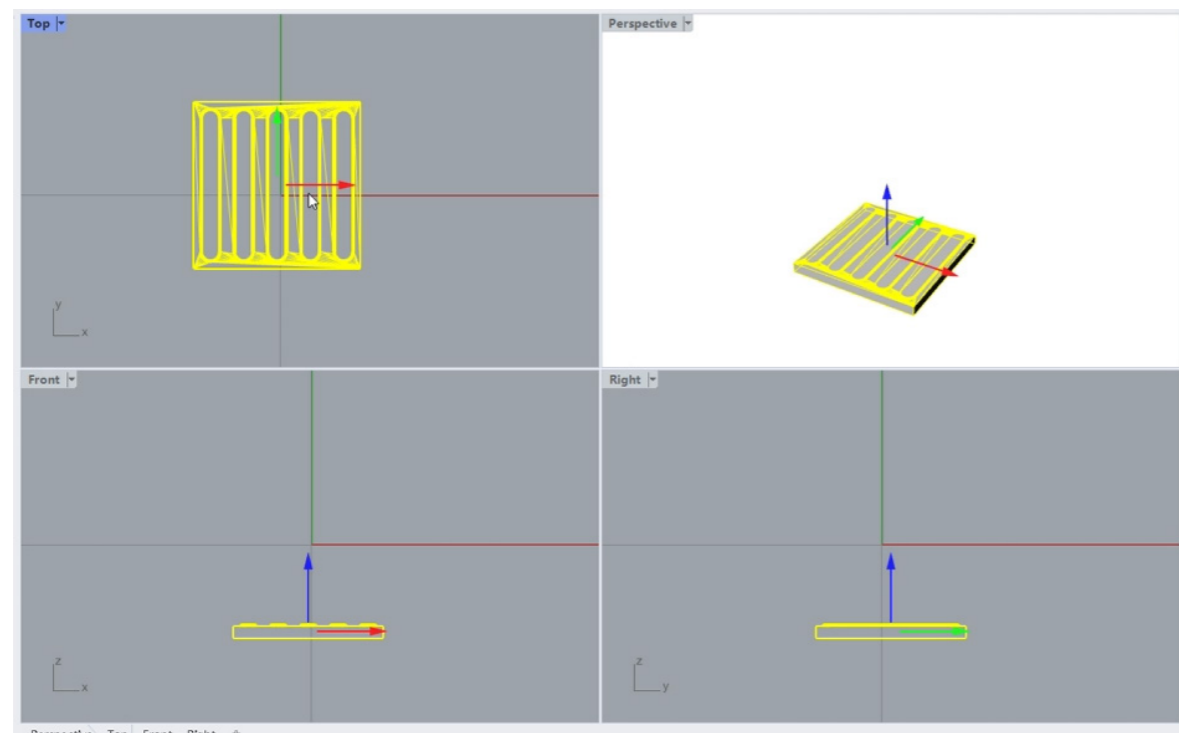


Here, I used a classic material package of UE, which contains a large number of materials of European architecture. At the beginning of the project, I wanted to build my street directly on the demo of this material package, but the overall style of these European buildings did not match my expectations, so I gave up, but still used some of the models.

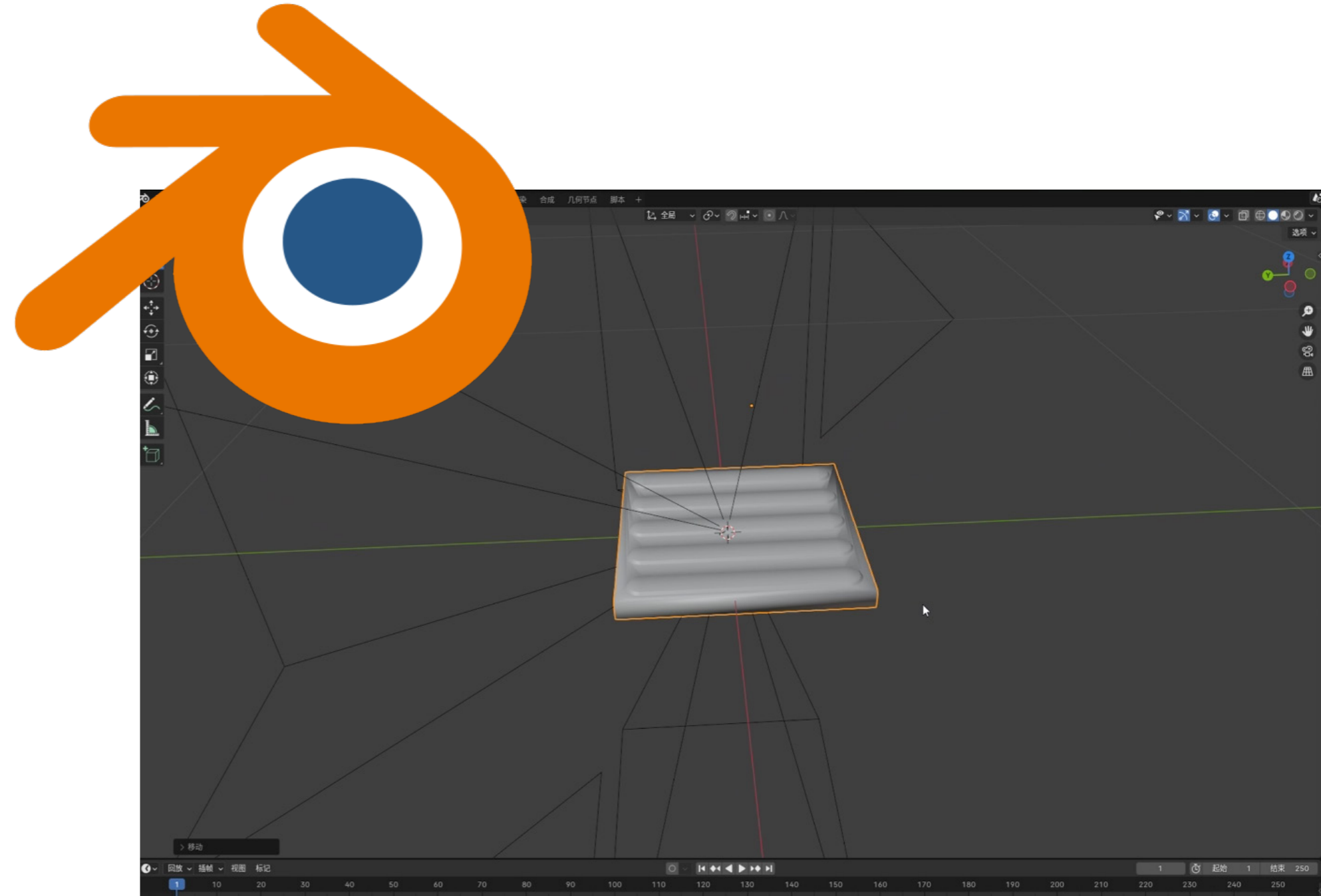


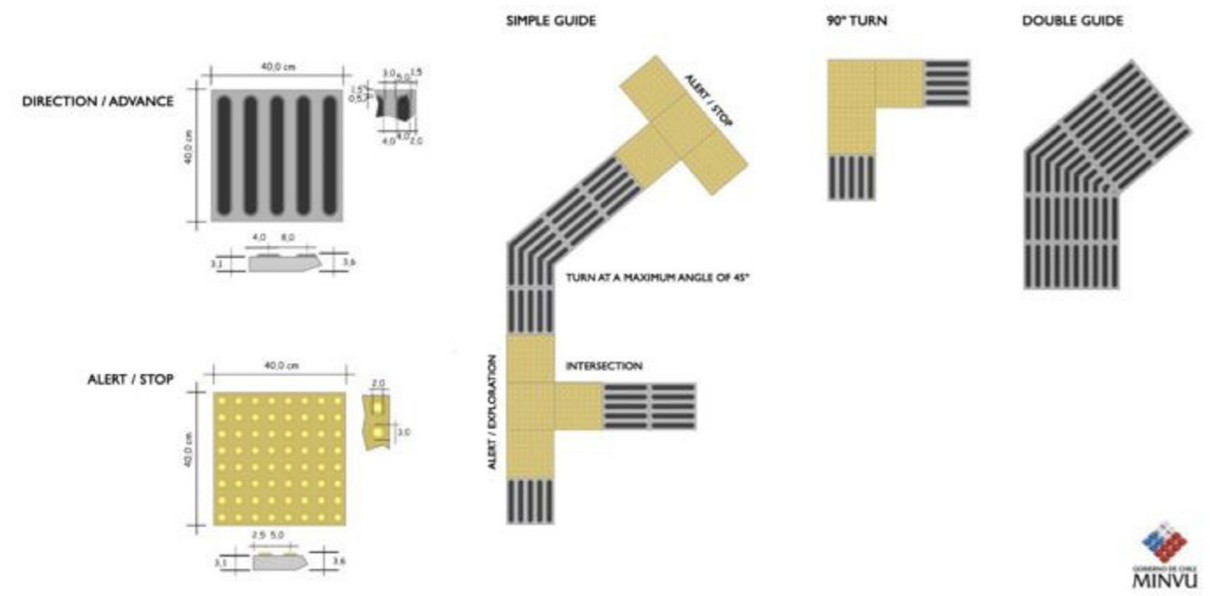
Later, I searched for many other resources, such as buildings, signs and so on. These models greatly reduced my workload.



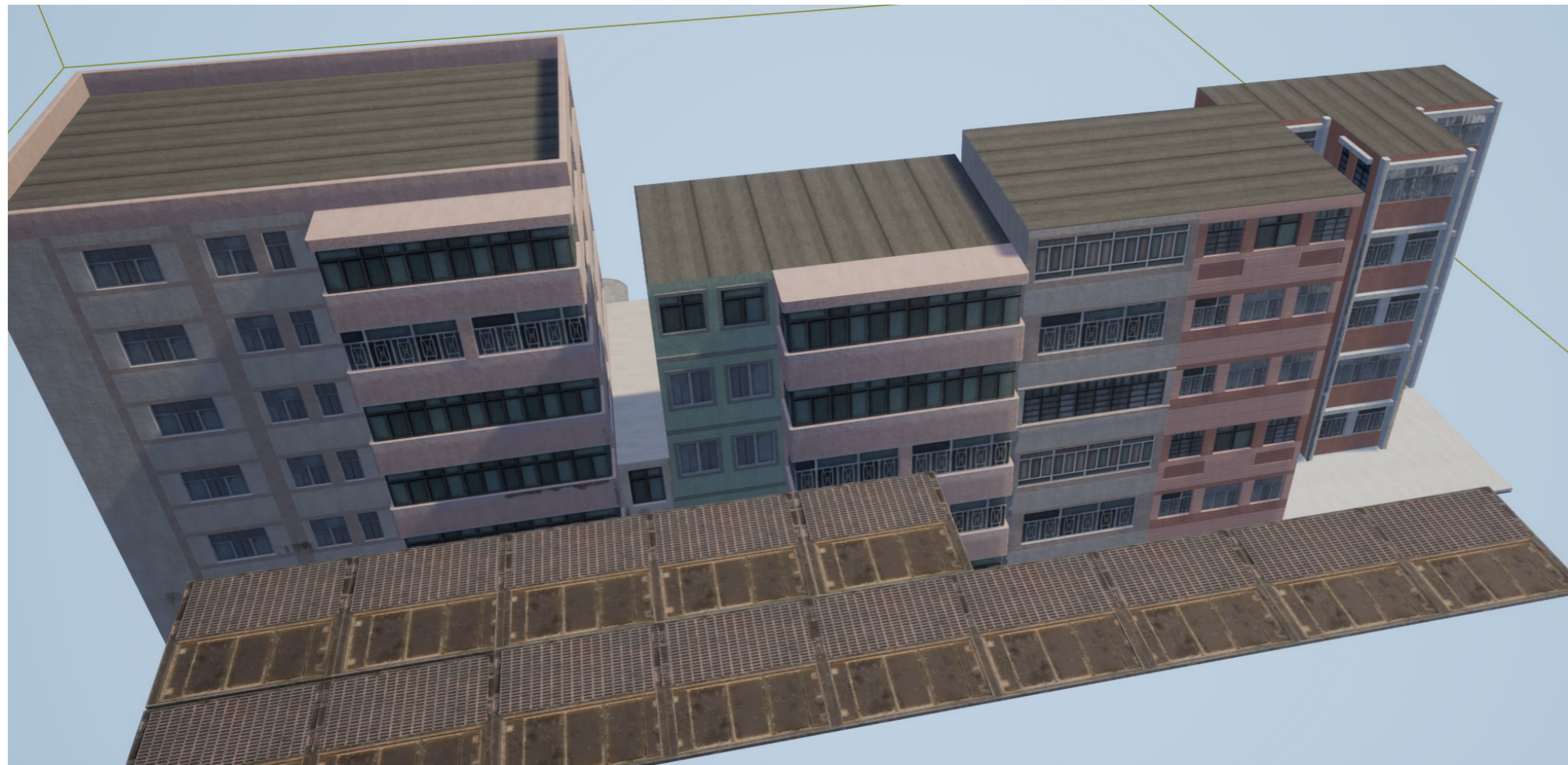


The brick design is supposed to be the easiest part, but I seem to have underestimated UNREAL, they don't seem to like Rhino very much, UE doesn't accept FBX models directly from Rhino, and usually need to be converted by plugins to use them. So I had to download Blender to import the model smoothly.





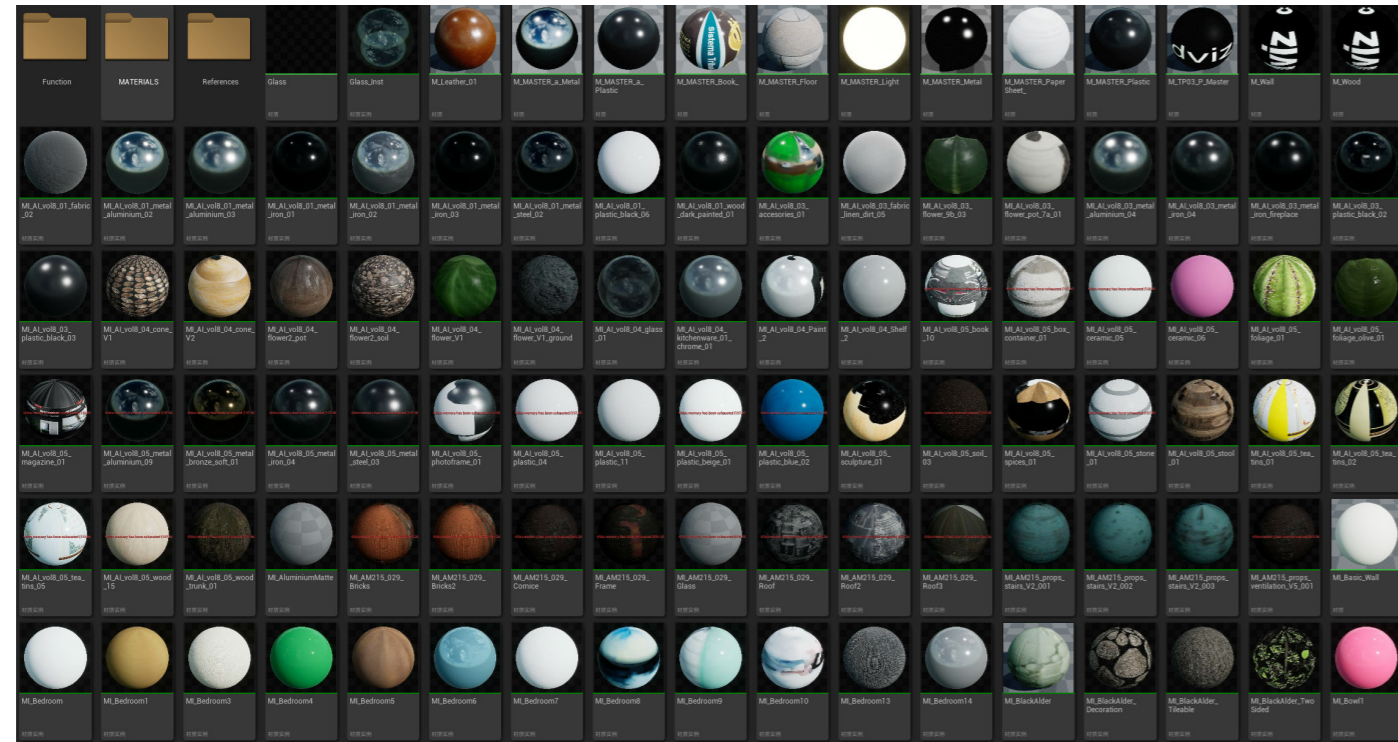
When laying floor bricks, I have been very careful about the way Britain is laying down the blind road, which makes the bricks in the game very less.



Using these models, I can easily build a whole street, but the hardest part for me is not that. The hardest part is interaction



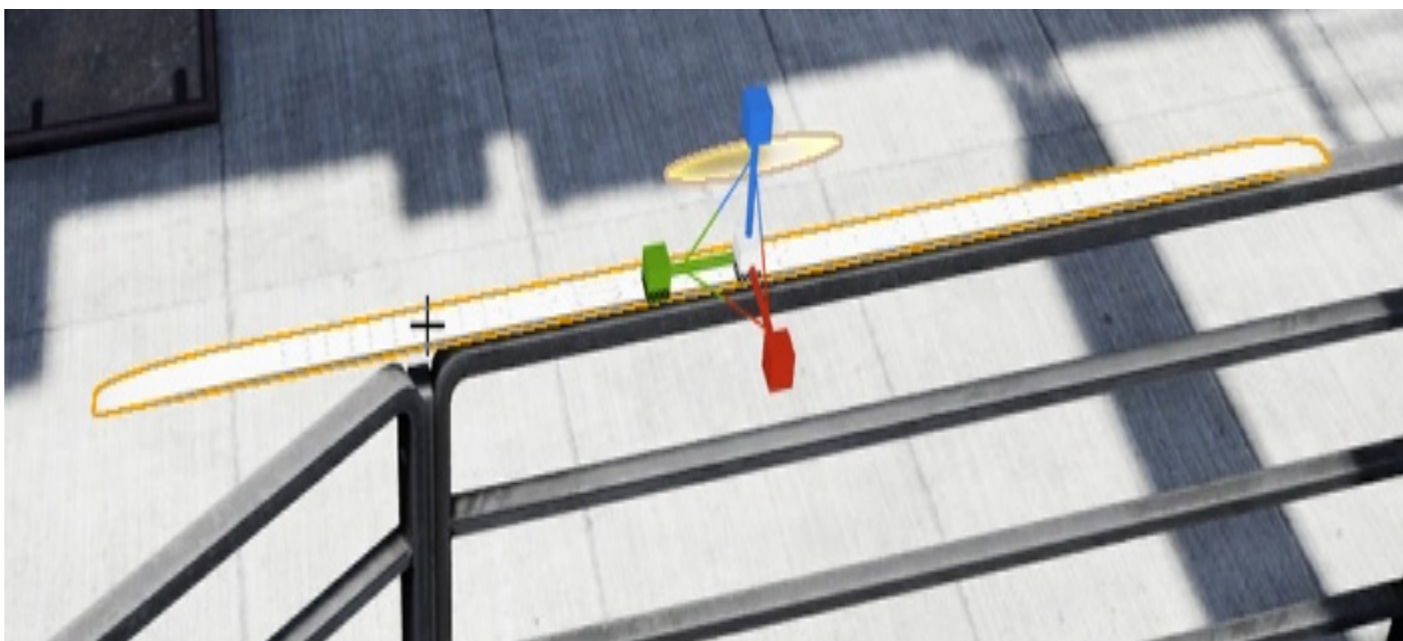
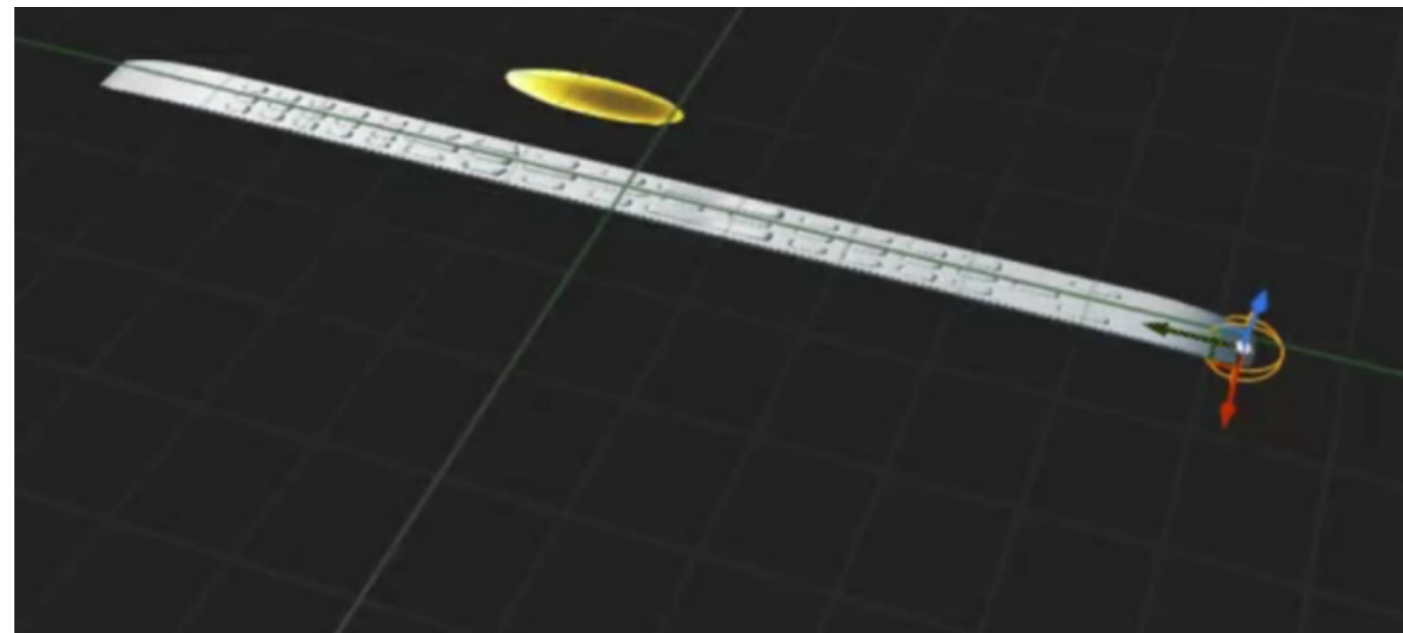
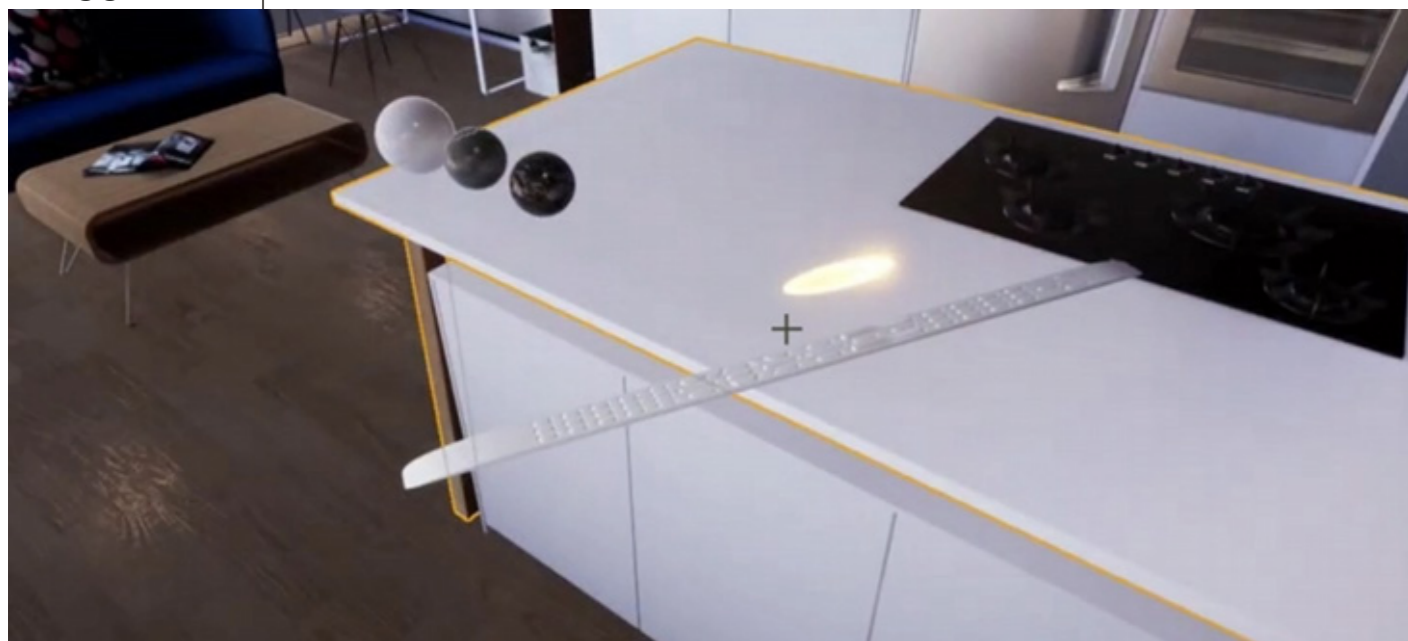
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Fortunately, I got a lot of help in this project. I've been going through a lot of websites trying to find tutorials for making vr games with unreal, but I can hardly find full tutorials, either sharing only a small part of it and having to pay for the lessons that follow, or people who are learning and sharing some of their experiences learning to develop vr with ue. These people assume that you have a high level of programming or that you have a lot of experience in ue development, so it's really hard to find a good tutorial. I can't solve many problems. So I sent an email to a video producer and asked him how to lift the cane and hope to hold it in the same position forever. He not only gave me the answer, but also sent me a teaching document, which contains a lot of cases, including passing, collision, etc., which also gave me the opportunity to learn backwards.

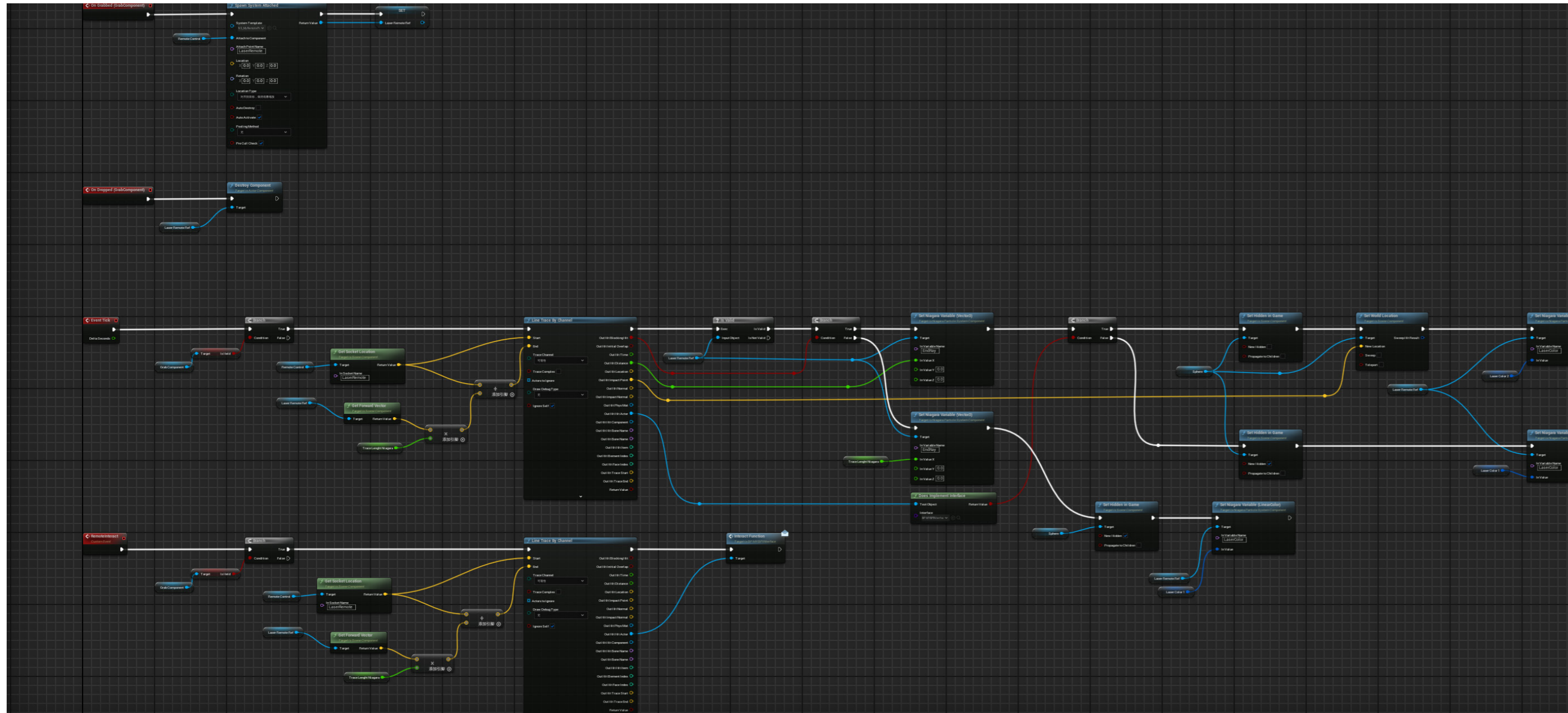


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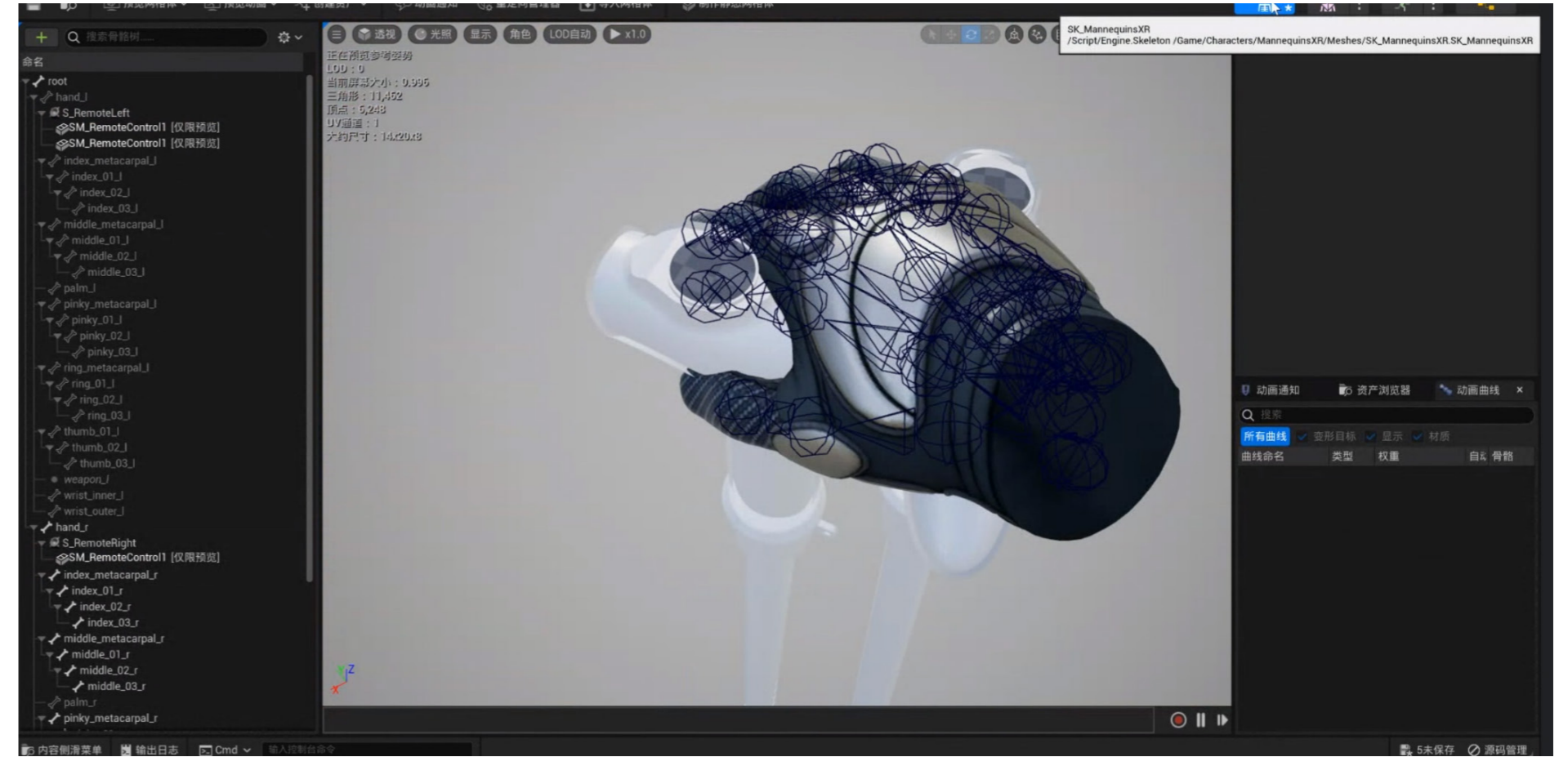
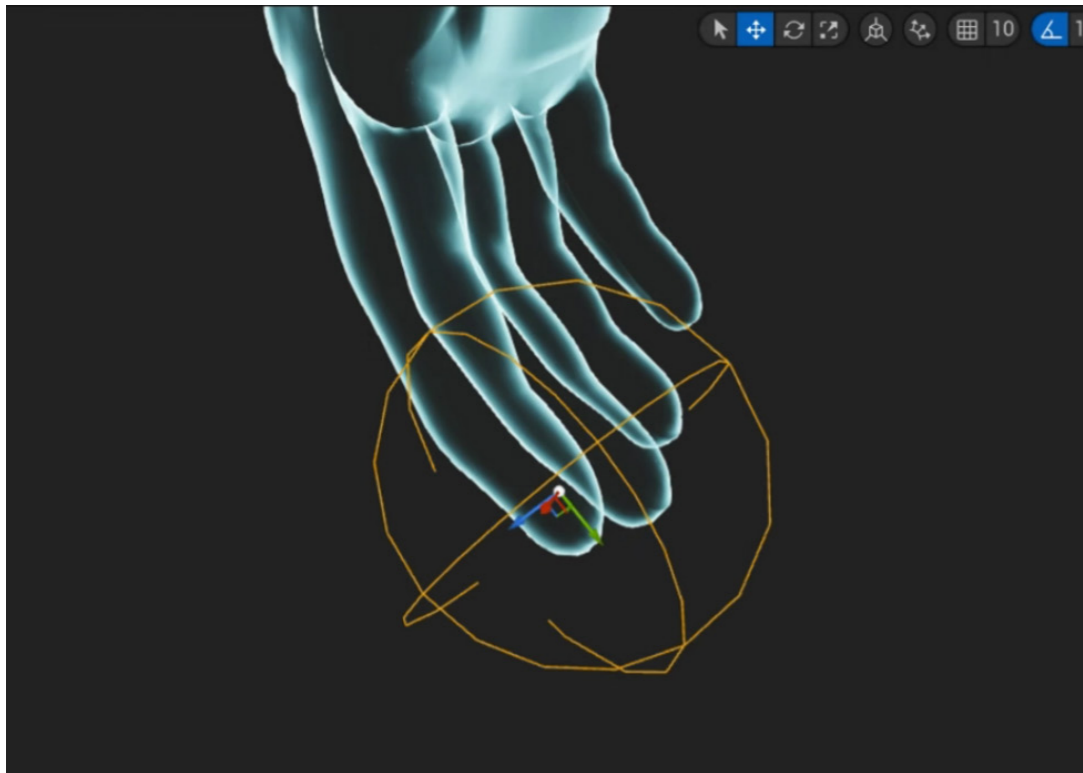


At the beginning of the crutch design, I didn't know how to hold an object, so I started playing with the remote control in the tutorial file, I tried to stretch the remote control so that it looked like the crutch.

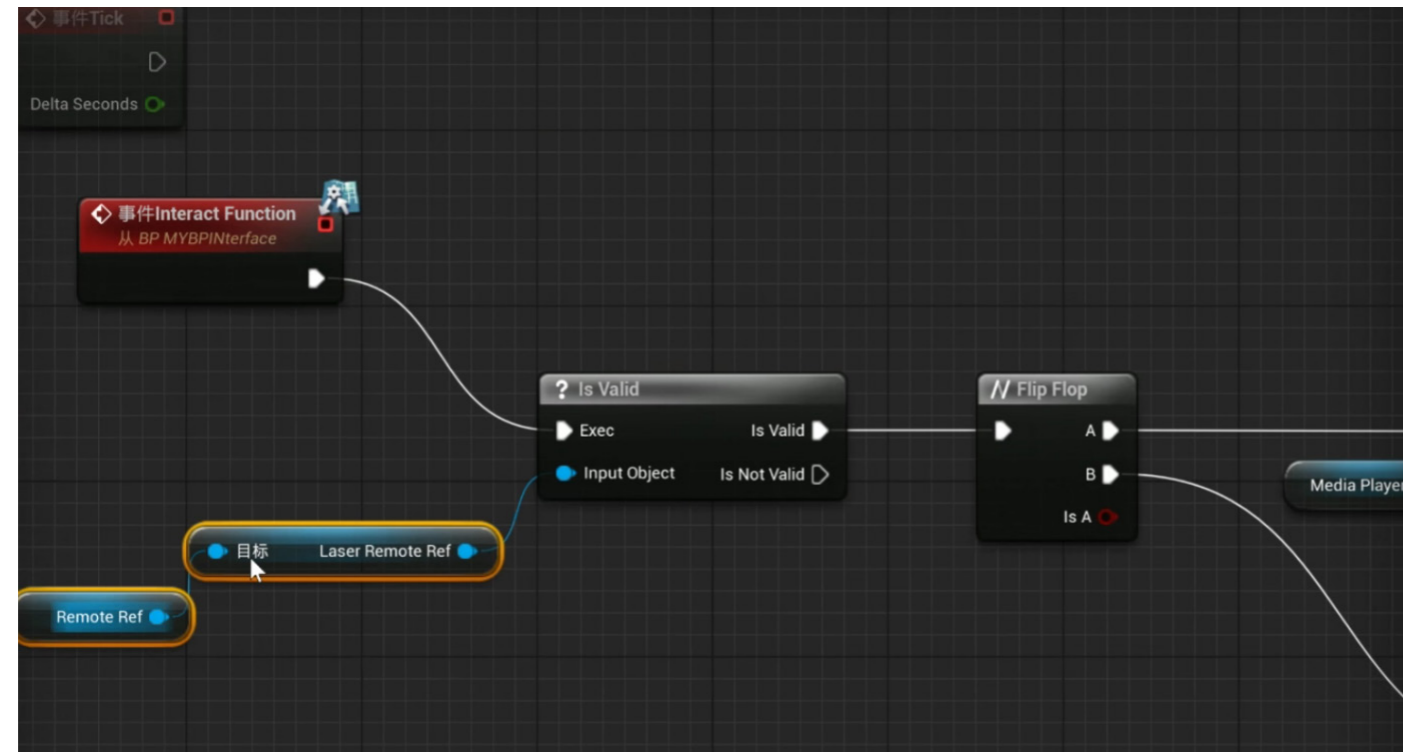
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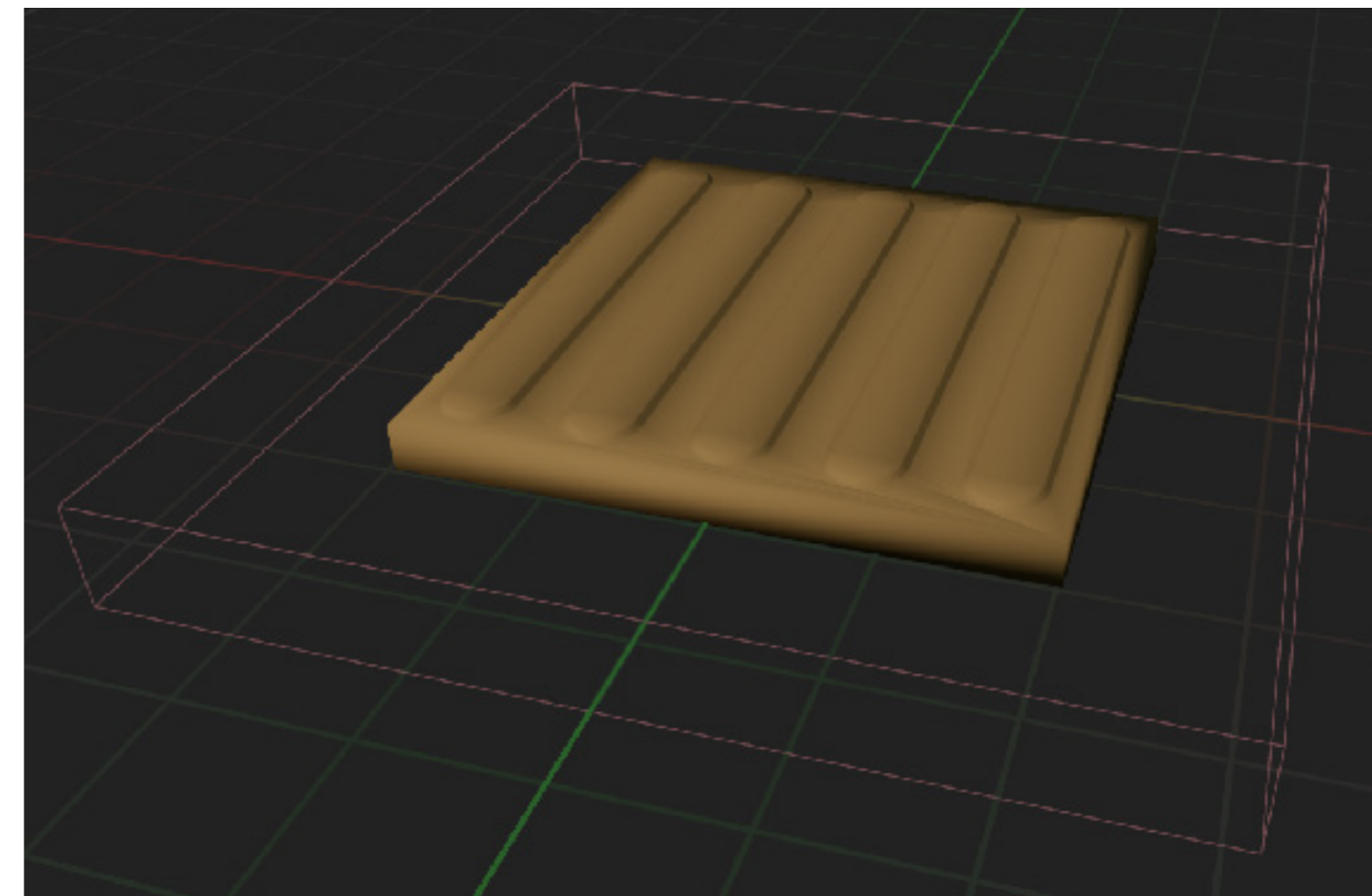
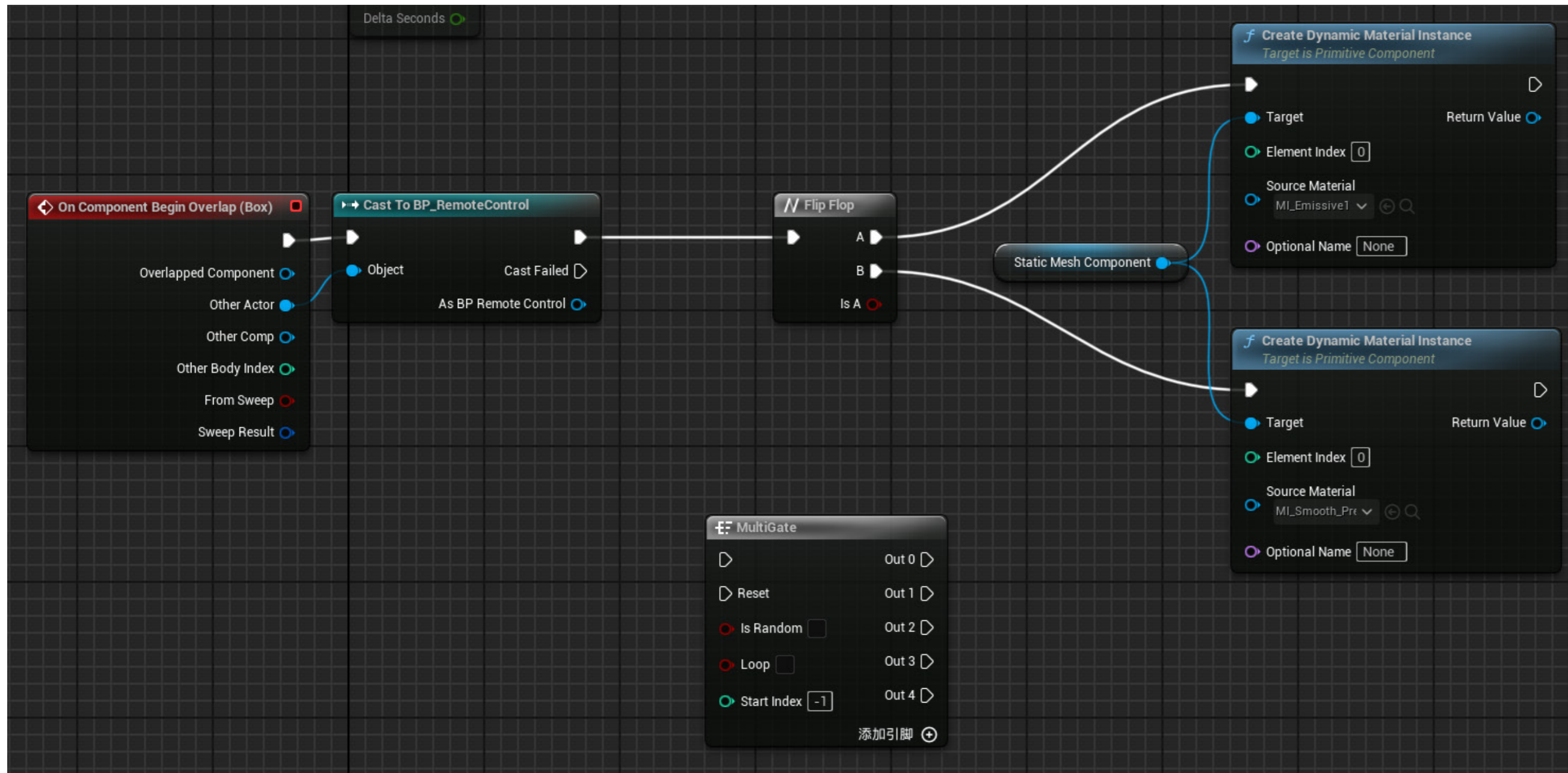
Then I found that the remote control model could be replaced, so I replaced the remote control model and imported the cane model. How I prevented a collision ball under the crutch, so that in the event of a collision, the object that was hit could execute the command.



60



Then I found that the remote control model could be replaced, so I replaced the remote control model and imported the cane model. How I prevented a collision ball under the crutch, so that in the event of a collision, the object that was hit could execute the command.



Unfortunately, when laying the bricks, I mistakenly thought that the blueprints could be later loaded onto the model, but they couldn't. The blueprint of the brick is very simple, only need to collide to change the color, but laying the brick is a physical work, nearly 200 fast bricks how to take half an hour





From the first few sketches, to the later collages, and finally try to copy and create, this journey is really incredible.

About Us

## Final

Finally, I finished the game, and I can be proud to say that the game has completed more than 80% of my goals. I can't believe that I can complete this project so well. The difficulties encountered in this process can not be expressed in words. All in all, I am very proud to finish this project.



FMP

## Reflection

*“I who am blind can give one hint to those who see: Use your eyes as if tomorrow you would be stricken blind.”*

First of all, I am very proud to have completed such a huge project, which I had not expected, I always thought that I could only complete part of it, because at the beginning of the project, I felt that it was too difficult to complete these things, every independent game developer's time to develop a game is measured in years. The success of this project is also inseparable from my accumulation since year2. The massive information and countless social activities have all helped me to better complete this project.

In this project, there are also some bad aspects. For example, because I cannot solve a problem, I will fall into a crazy state, and my work and rest time will be completely disrupted (which is very similar to a real game producer), and I will not arrange every link reasonably. If I can manage my time well, I think I can complete more content.

In this project, I think the most important thing is that I have found the field I really like. Every time I learn new knowledge and new skills, I am very excited and happy. In previous projects, I studied and spent time making works, which was more of a mindset of completing homework, while in

this project, I am a mindset of completing my dream. Making games has aroused almost all my interest, I frantically searched for all kinds of tutorials on the Internet, and I would send messages one by one to ask the authors of those tutorials. By this method, I have overcome many technical difficulties, and I think if I have the chance, I will try to continue to study and work in the field. Maybe one day, you will see my games released on steam.

Finally, I think this project is very meaningful. Since my sophomore year, I have been studying how to make things easier for the disabled and provide them with a better quality of life. In the last project of my junior year, I exhausted all the knowledge I had learned in the past three years and made a project that satisfied me. I believe this game can really give a voice to those who are visually impaired and make more people pay attention to the situation of people with visual impairment. The game is currently being reviewed by steam and is expected to be released in July, and the game will be free to play.



END