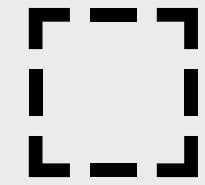


Wentao Ma's Portfolio



October 2024

I recommend visiting the website below. There is more dynamic content to help you understand my projects better.

<https://tonytheshrimp.github.io/MyPortfolio/index.html>

故事：从 AR Face Tracker 到 AR Sports

AR sports was undoubtedly the project that consumed most of my high school years. My journey began in early 2022 with a deep dive into game development, where I laid the foundation by creating an **AR Face Tracker**. It won **Apple WWDC Swift Student Challenge** for me because the creative gameplay.

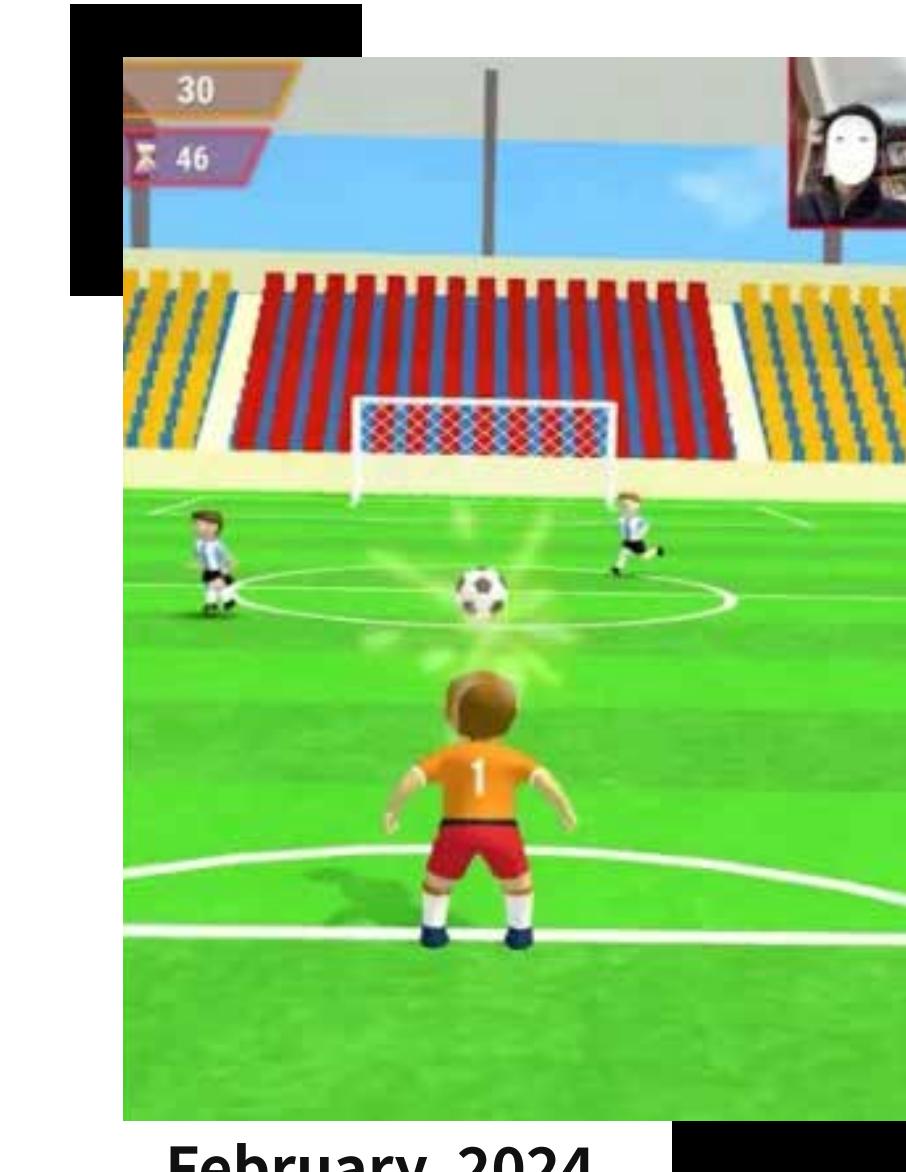
Over subsequent two years, I dedicated countless hours to refining my skills and optimizing the game, fueled by a passion for pushing the boundaries of augmented reality. The culmination of this effort was the successful launch of the AR sports app on both the App Store and Google Play in 2024.



March, 2022



December, 2022



February, 2024

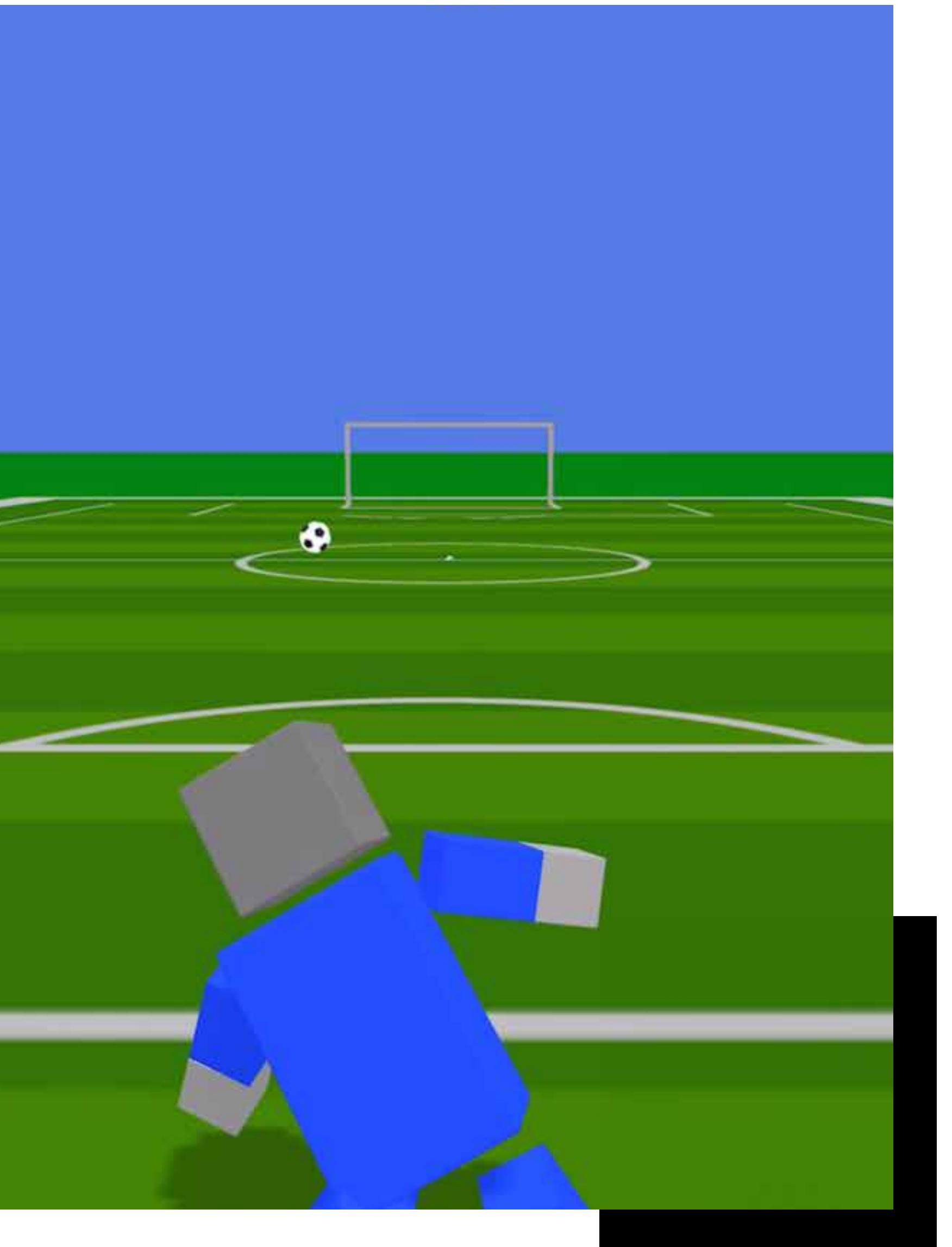
AR Face Tracker

Duration: 3 months **Tools:** Swift on Mac

In early 2022, I embarked on a challenging yet rewarding journey by entering the Apple WWDC Swift Student Challenge.

My project, AR Face Tracker, harnessed the power of AR Face Detection to introduce an innovative gameplay mechanic. Players intuitively controlled the goalkeeper by tilting their heads left and right to defend against incoming balls. While my artistic abilities were limited at the time, resulting in somewhat rudimentary visuals, the game's groundbreaking human-computer interaction method ultimately secured me a coveted award.

It was a testament to the power of creative problem-solving and the potential of augmented reality. As an added bonus, it helps mum relieve back and neck pain after long periods of sedentary work.

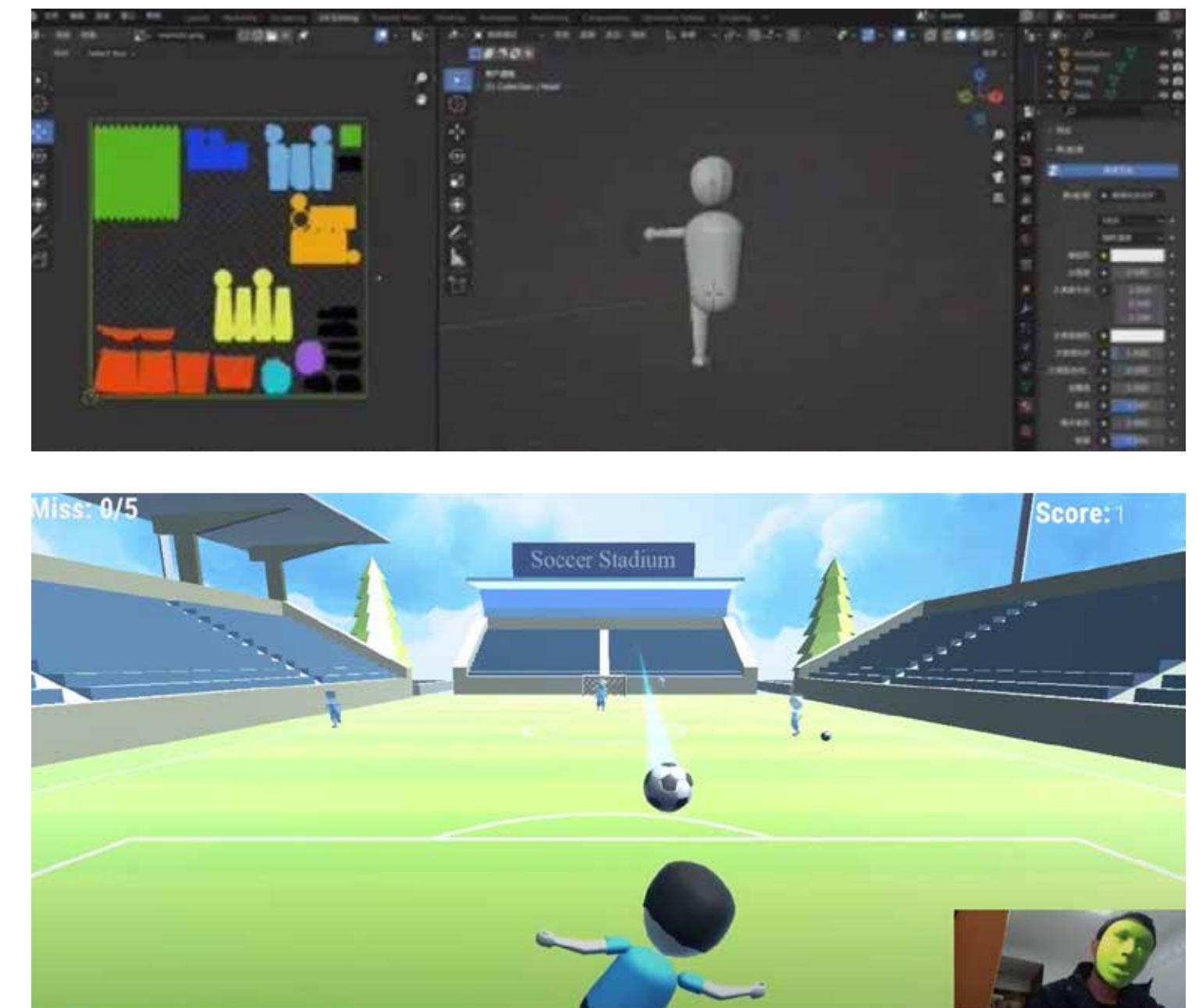


[01]

**Story: From AR Face Tracker
to AR Sports**



A screenshot of a Coursera specialization certificate. At the top left is the Coursera logo. To its right is a green Michigan State Spartans helmet icon. Below the logo, the text "5 Courses" is displayed. A list of courses is shown on the left: "Game Design and Development 1: 2D Shooter", "Game Design and Development 2: 2D Platformer", "Game Design and Development 3: 3D Shooter", "Game Design and Development 4: 3D Platformer", and "Game Design and Development 5: Capstone Project". The main title "Game Design and Development with Unity 2020" is centered. Below the title is a detailed description of the specialization. On the right side, there is a signature of "Brian Winn" and his title "Professor, Michigan State University, Department of Media and Information". At the bottom right, there is a link to verify the certificate at <https://coursera.org/verify/specialization/98Q3DQ8S6RHP>.



I made models of the soccer players.
The scene was purchased from the Unity Asset Store.

Studied On My Own

Duration: 6 months

Tools: Unity, blender, photoshop

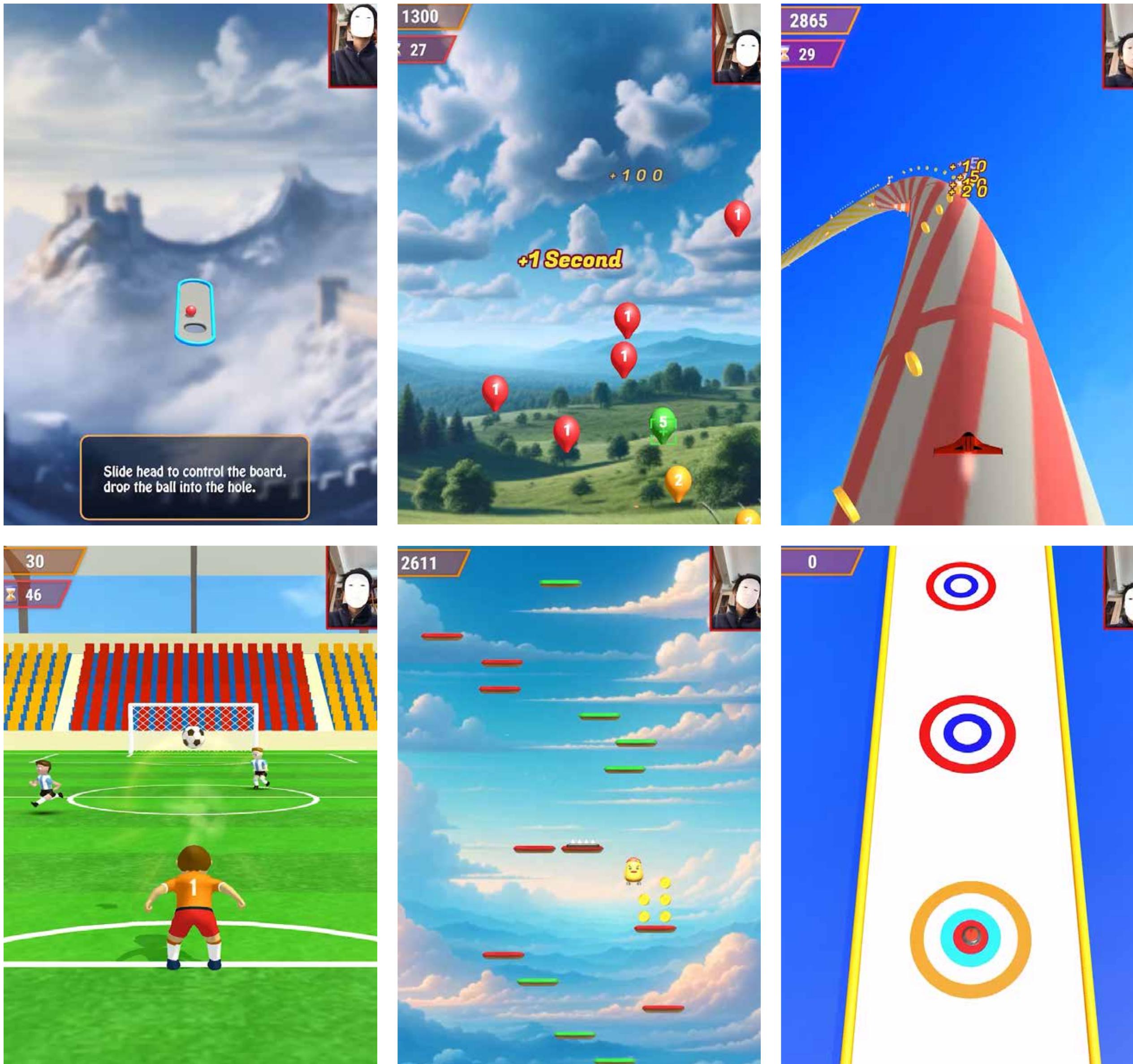
To expand the reach of my game beyond its initial platform, I selected Unity, a renowned game development engine. While simultaneously completing five Unity courses on Coursera, I delved into the realms of Photoshop and Blender to enhance the game's visual appeal. By the end of 2022, I had successfully reimagined the game using Unity's powerful tools and submitted an application to CMU's prestigious High School Game Design Academy.

AR Sports

Duration: 12 months

Tools: Unity, blender, photoshop

Throughout 2023 and 2024, I worked on refining and expanding the game's features. I improved the game's art and created five new mini-games, introducing five more innovative control methods, each offering a unique gaming experience. This enriched the gameplay and catered to a broader audience. Each game offered a different head and neck exercise, which sedentary people could use to relax and entertain themselves. These efforts culminated in AR Sports, a comprehensive augmented reality sports mini-game collection. In early 2024, I proudly launched AR Sports on the App Store and Google Play. Although I faced challenges in marketing due to my limited experience and resources, I was excited to share my creation with the world.



[02] Hellevator!

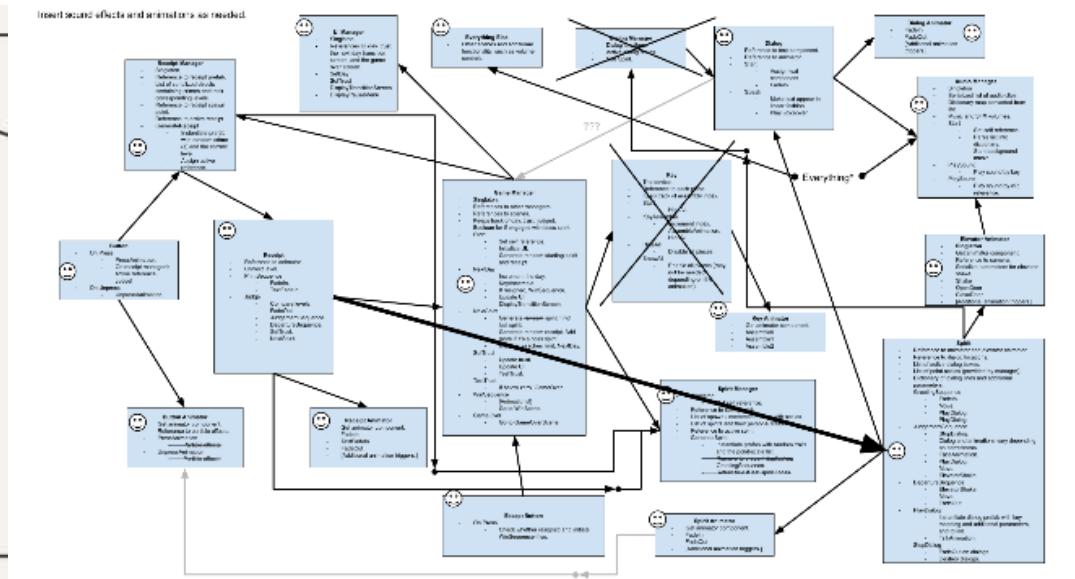
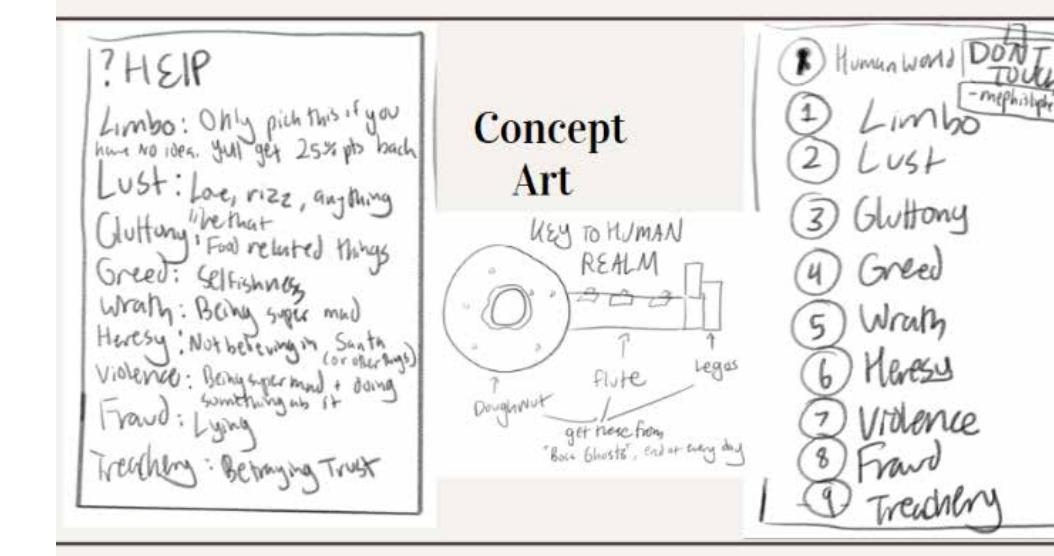
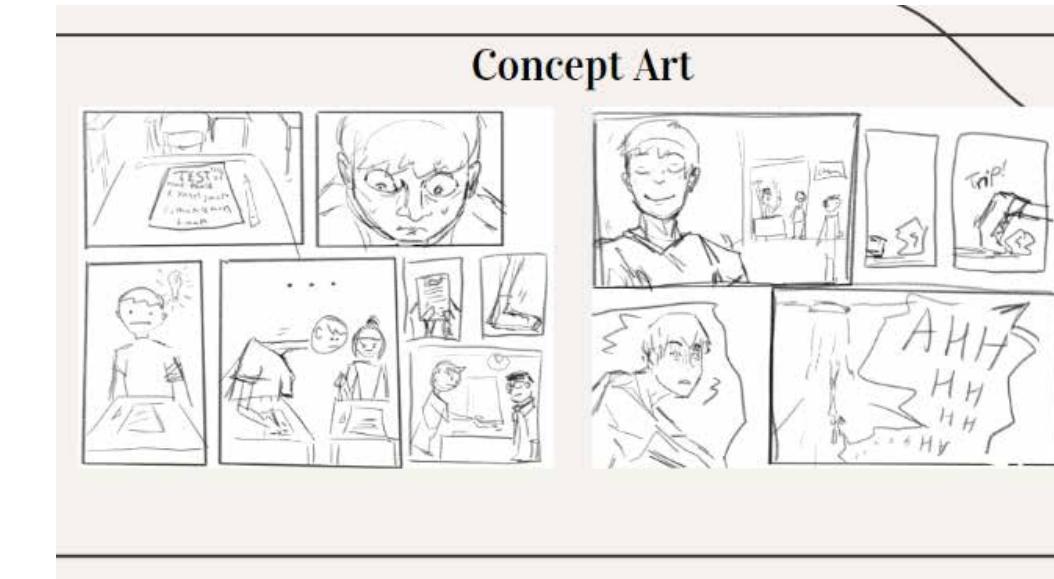
Duration: 3 weeks full time
Tools: Unity

A whimsy game about sorting ghosts into the correct levels of the inferno.

Step into the shoes of Dante, a twelve-year-old in an unexpected predicament. After a fateful math test cheat, he tumbles headfirst into the fiery depths of Hell. Now, under the watchful eye of the infamous Mephistopheles, Dante takes on a peculiar role: elevator operator to the underworld. As ghosts, spirits, and souls



● Wentao Ma's Portfolio

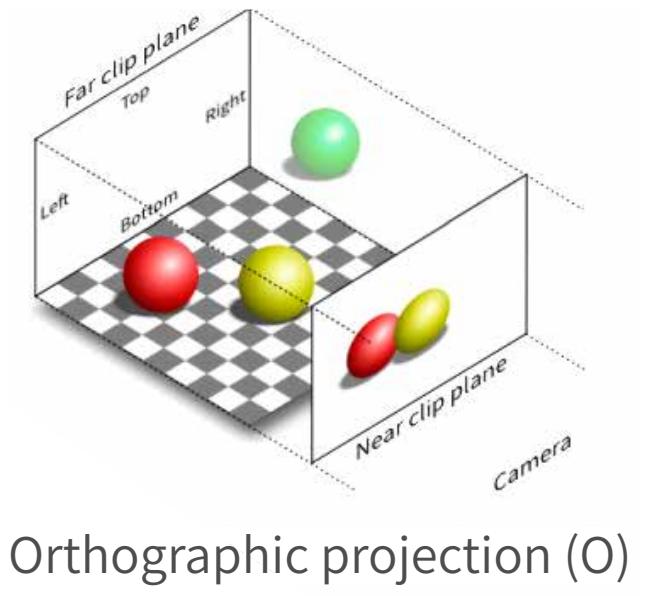
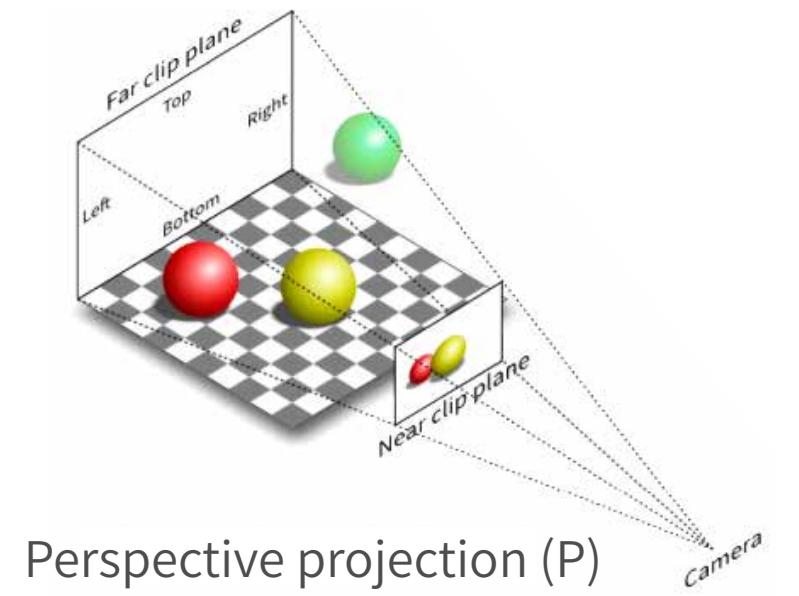


file past, he must swiftly judge their earthly transgressions based on their "life receipts." With the clock ticking and Mephistopheles's expectations soaring, Dante must navigate the delicate balance of justice and efficiency. One misstep could seal his fate in this infernal realm.

This game was developed during the National High School Game Academy in CMU. Our team, named Peculiar Geese, has five members: Megan (production, sound design), Ellie (art), Ashley (art), Alex (programming) and me (programming). It received the Best Use of TA Resources award for involving all the TAs in voiceover.

Source codes and introduction video are available on Github and Youtube now.

[GitHub](#) [YouTube](#)



Monument Valley is one of my favorite games. Cleverly using optical illusions, the game creates seemingly impossible mazes and paths, giving players a sense of surprise and accomplishment when solving puzzles. The first time I saw this game, I couldn't help but be amazed by its creativity.

03

Monument Valley Clone

Duration: 2 weeks in summer break

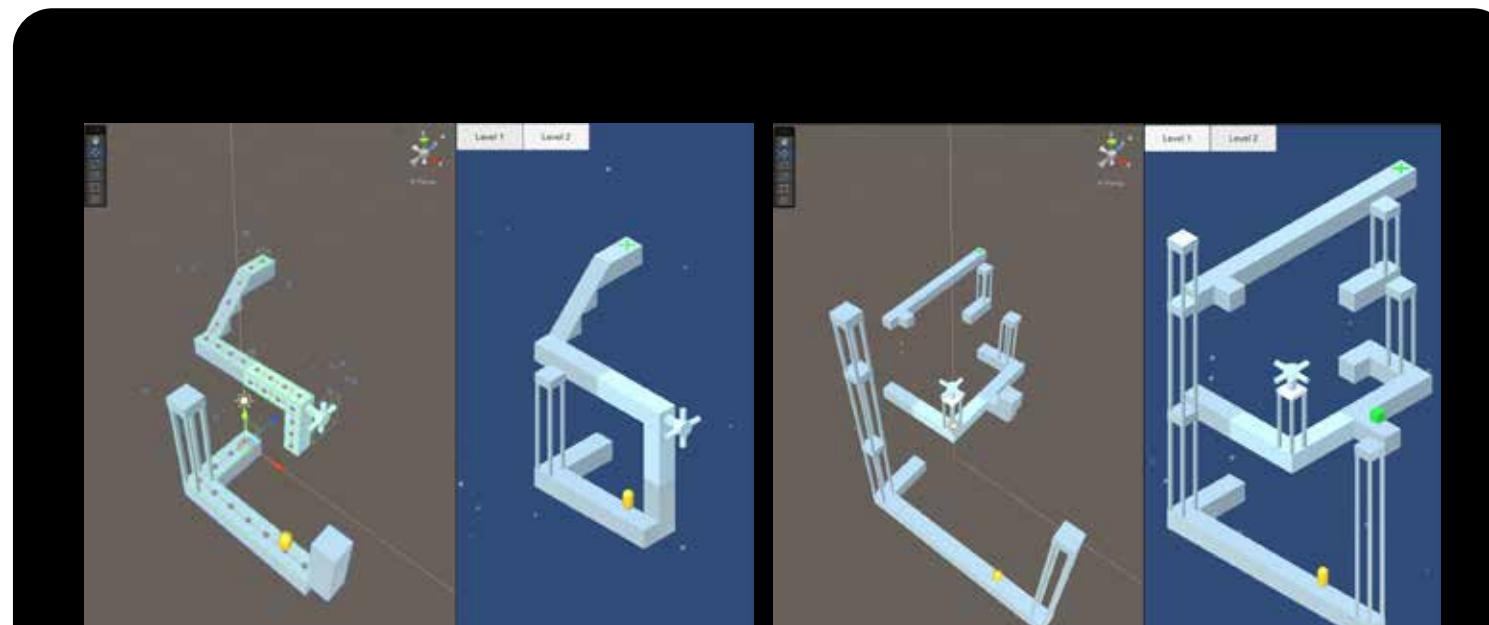
Tools: Unity

This summer, based on the open source project on Github:

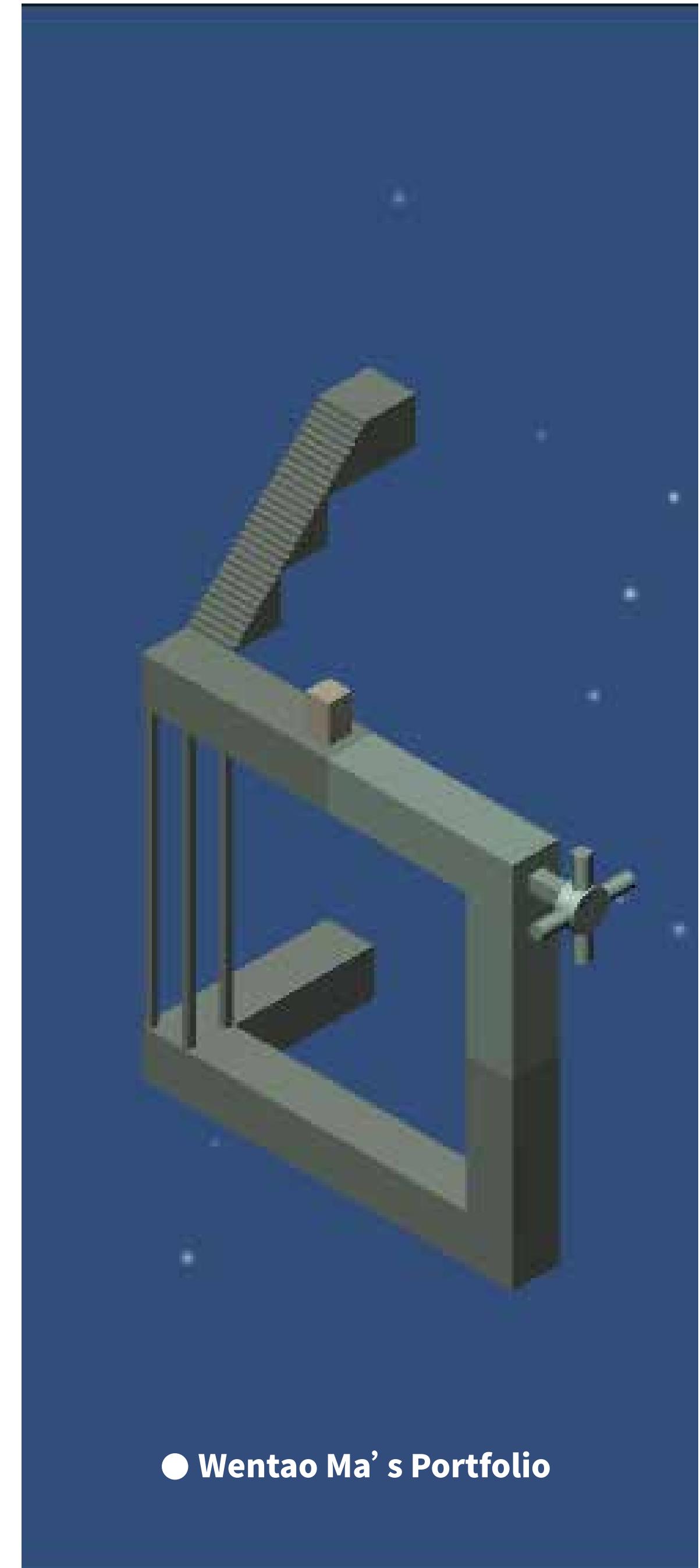
<https://github.com/snhwv/Monument-Valley>

I made a simple implementation myself.

The basic 3D visual dislocation technology of the Monument Valley game is just orthogonal projection in computer graphics. After projecting 3D objects onto a 2D plane, the connection relationship of 3D space objects is determined based on the position relationship on the 2D plane. This makes it possible to achieve path connections that are impossible.

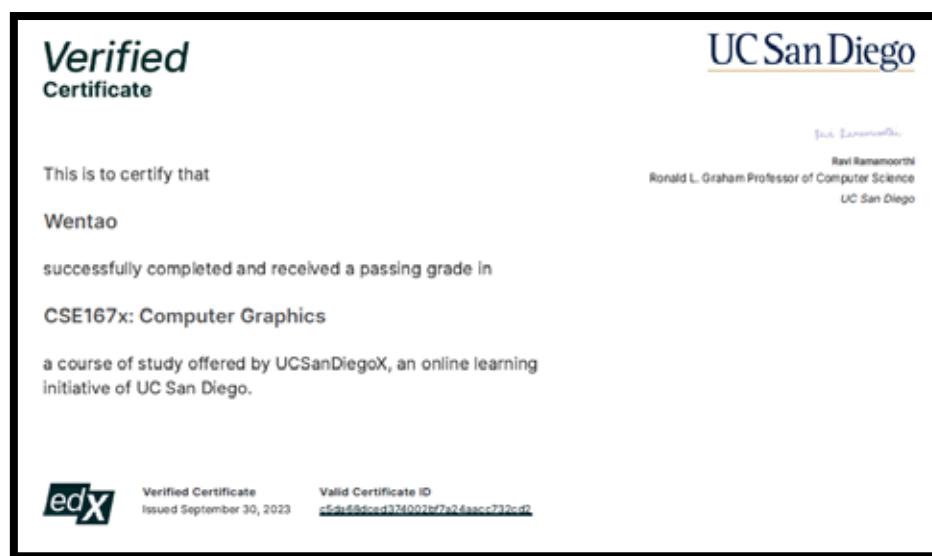
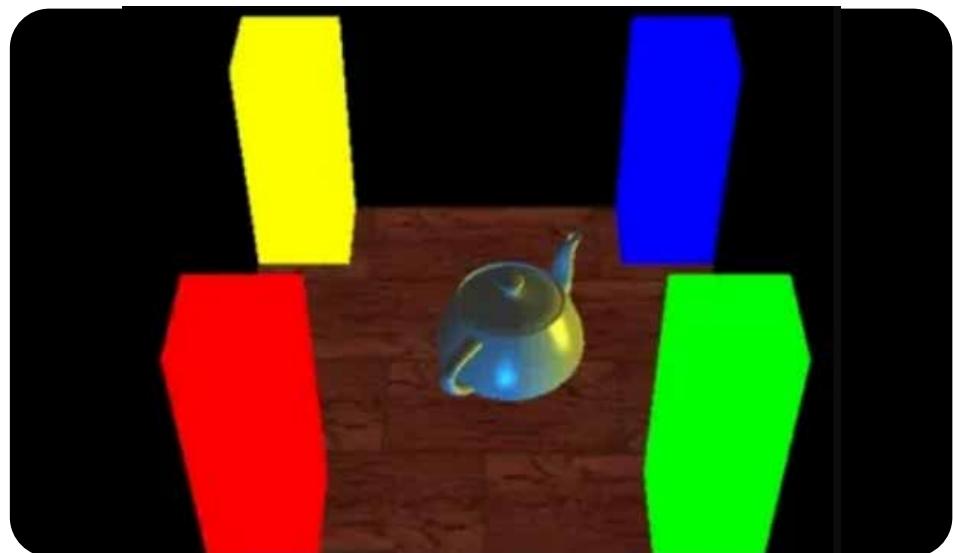


I made two simple levels, which can be played here



Computer Graphics Course on Edx

I studied the basic courses of computer graphics at edx, learned the necessary mathematical knowledge, understood the concepts of 3D, the principles of space mapping, and the basic implementation algorithms such as texturing and lighting.



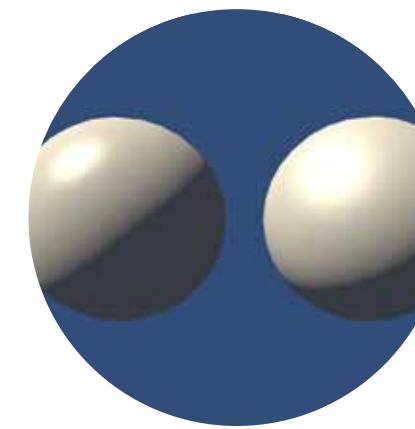
Unity Shader Implementation

Duration: 4 weeks in winter break

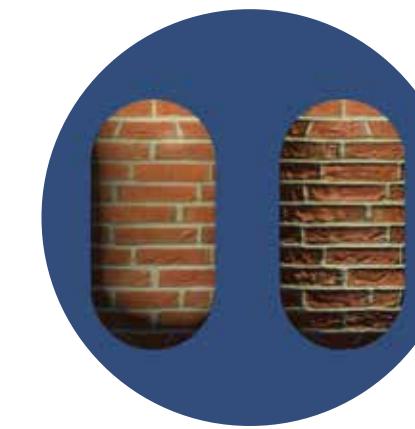
Tools: Unity

Although Unity has provided the ShaderGraph function to simplify the implementation of shaders greatly, experienced seniors recommended that I understand the implementation of shaders from the code level as a necessary essential skill for a developer, so I followed the tutorial and worked hard to implement some basic shaders. This allowed me to understand the fundamental underlying logic of 3D graphics operations. I also more clearly mastered implementing simple shaders as needed and controlling the realization of the required 3D effects.

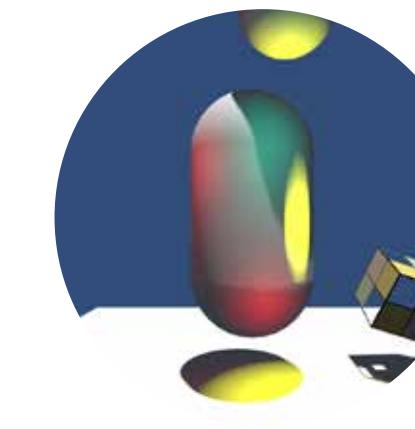
104 Computer Graphics Self Study



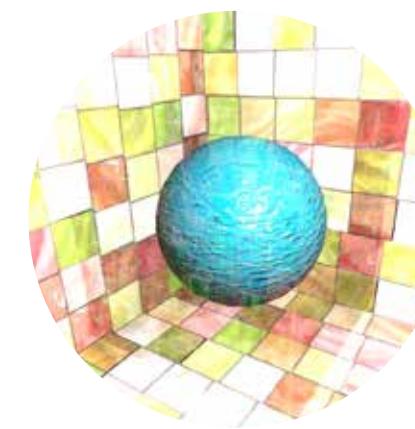
Simple Shader



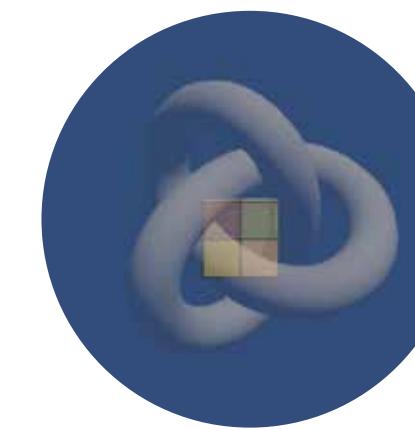
Bump Map



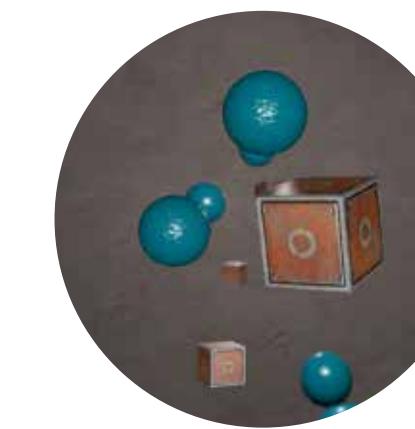
Illumination



Illumination 2



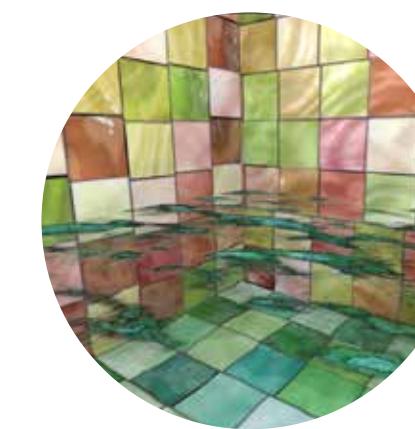
Transparent



Mirror



360 view box



Water



Fog

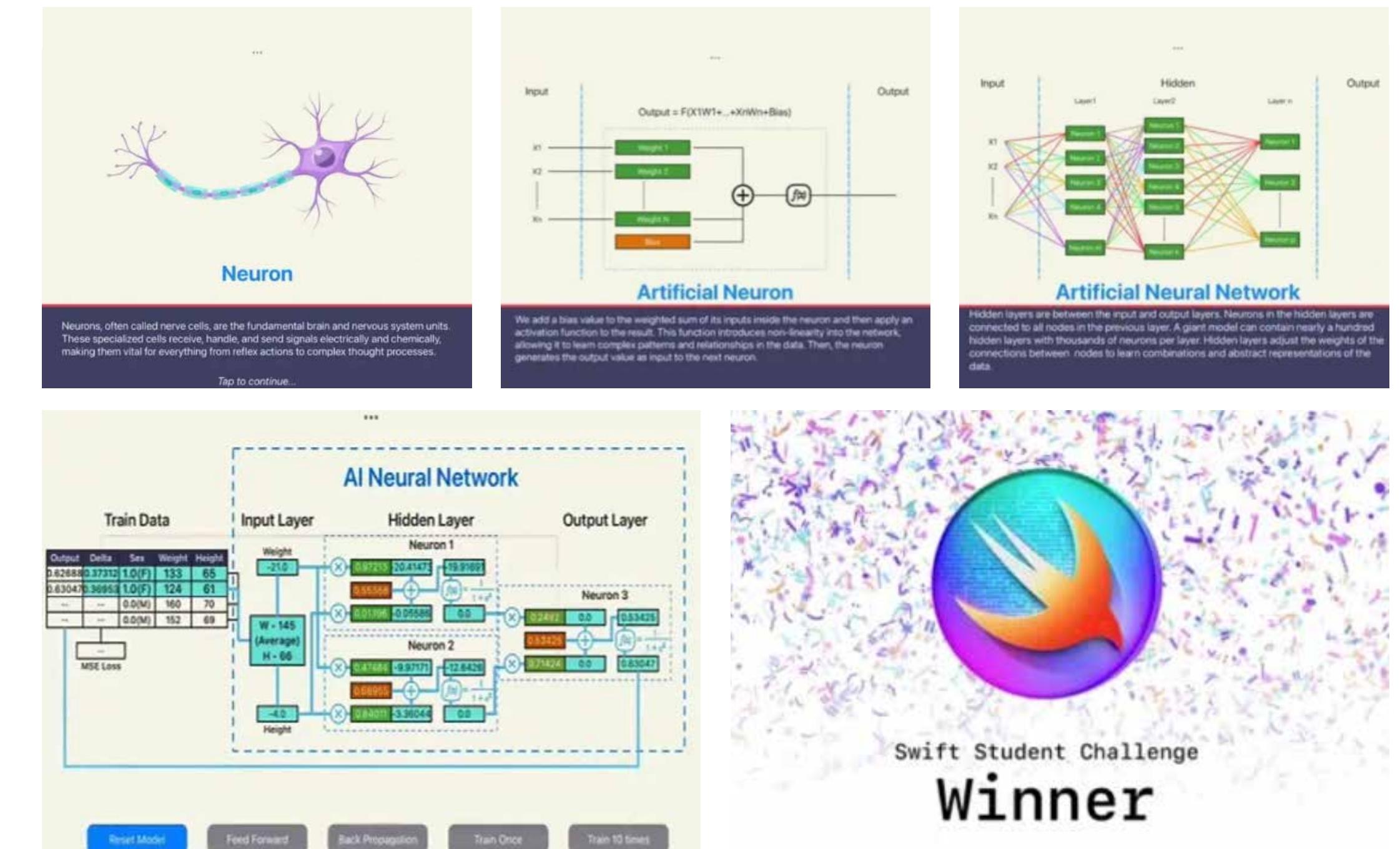
05

AI Neural Network - 2024 Apple WWDC Swift Student Challenge Winner

Duration: 3 weeks full time in winter break

Tools: Swift on Mac

In 2024, I returned to the Apple WWDC Swift Student Challenge, eager to explore new frontiers. Amidst the burgeoning landscape of AI, I was captivated by the technology's potential. Over the winter break, I immersed myself in AI fundamentals, culminating in developing a primary neural network using Swift. My submission showcased a step-by-step breakdown of the neural network training process, making complex concepts accessible to a broader audience. Fueled by my passion for AI, this innovative approach again secured me a coveted award.



[06] Miscellaneous

Small projects for Game Design and Development with Unity 2020



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Websites I made

被领养的猫猫的幸福生活

幸福的猫猫

花花 四毛 尼卡 小泥鳅
胖猫 黑哥 招财 钱子
胖婆 胖子 花月

Adopted Cats

前一页 2 / 60 后一页

Delivery Rider Street Survey

Home Analysis Stories About Us

Stories of delivery riders

Mr. Huang, 26 years old, has been a delivery man for 4 years. "I joined this industry because I thought it was a good job. After 4 years, I found that there is no freedom, unless you don't want income. I run around outside for at least 12 hours a day, and when I get home I'm so tired that I just want to lie down. Not to mention freedom, I don't even have any time for myself."

Mr. Yan, 48 years old. "I've been doing this for 10 years. My son is a college student, and he also does internships and research during the holidays like you do. I don't see him much more than a few times a year."

Mr. Fan, in his 40s, has been working outside for more than a year. "I used to do heavy work, but later my health deteriorated and I couldn't do it anymore, so I started doing delivery work. Do it? I'll see. What I want to say most is that everyone is working hard, so we should understand each other. We deliverymen are most afraid of complaints. The company doesn't care about us. If there is a complaint, we will be fined and our day's work will be in vain. I try to work as much as possible, as long as there is no complaint."

Delivery Rider Stories

Cat Face Recognize Application

Duration: 1 week in summer

Tools: Unity + OpenCV

After I conducted research guided by CMU Prof. Pradeep Ravikumar, studying a novel sampling method in machine learning named Simcoe to enhance image classification tasks and wrote a paper on the effectiveness of Simcoe. I later applied this algorithm to develop an app that could identify my cats through facial recognition.

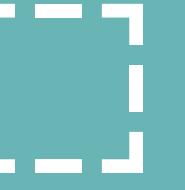


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The Five Cats Companied Me These Year



Wentao Ma's Portfolio



Thank You

October 2024