

Engine
Unreal

VR Device
Meta Quest

Team Size
4 Members

My Role
Team Leader
Game Designer
(Gameplay, Narrative,
Level, System)
Programmer

Development Time
3 Months

Duration
5-7 Mins

STRATFORD WONDERLAND

AN IMMERSIVE VR EXPERIENCE
BASED ON LOCAL RESEARCH AND SOCIAL REFLECTION

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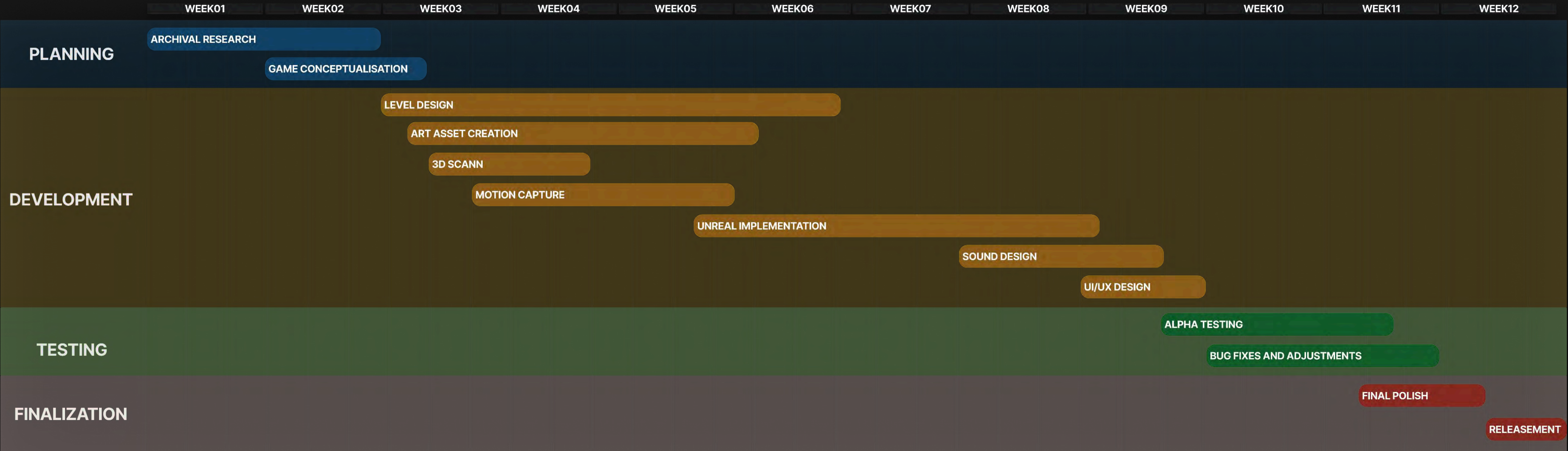
Project Timeline

WEEK 1-2

WEEK 3-9

WEEK 9-11

WEEK 11-12



Menu



Group Collaboration

As a large, research-based VR game project, the project involves many complex game making techniques and different areas, so multi-player co-operation for development is necessary. In this project, we used **MoCap, 3D scan, and other technologies** that require multiple people to work together at the same time.

Therefore, a reasonable division of labour and consistent goals are very important. As a **game designer, programmer and team leader** in the team, I ensured the smooth implementation of the project through a number of project management methods and adequate communication within the group.



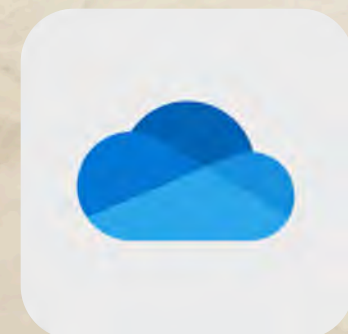
GROUP COLLABORATION

As a large-scale VR project, the project made innovative use of many new technologies and elements, which required us to divide up the work and sit at the end of our own projects.

So the task have been evenly distributed as Research, Model Making, Animation Making, Unreal Implementation (Programming).

PROJECT MANAGEMENT

The project was managed using Microsoft Planner for project management and deadline management, and OneDrive for content sharing and delivery.



EFFECTIVE COMMUNICATION

Meetings were held twice a week to discuss the project process and control the direction of the project



Brain Storm and Research

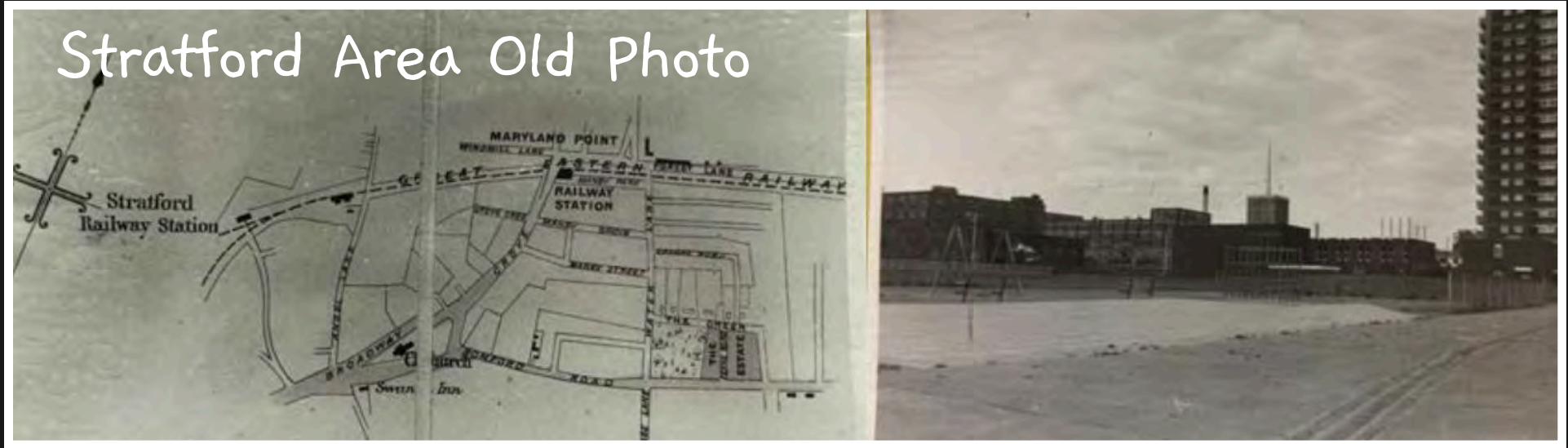
We want to make a VR game based on the history of our Stratford community.

ARCHIVAL RESEARCH

Connect Social Concern, Community Reserarch and Game design

In this project, we want to focus on **our own community**, the Stratford area in London. Investigating historical archives and materials at the New Ham Library Service, we learnt that in 2000 there was a proposal to build an amusement park and rides in the Stratford area , but the plan was not taken forward due to financial and environmental impacts.

Through further literature research we have learnt that **the environmental impact of amusement parks is huge**: they cause a lot of waste of water and generate light, plastic and noise pollution (National University of Singapore,2022).



CONCEPT INITIATION

Design Horror Game with VR Headset

Based on the results of archival research and studies, as well as our desire to make a VR game in the first place, our team came together to think about several possible concepts.

1

Create an amusement park simulator to show the possibilities of what would happen if an amusement park was built in the area by simulating items in an amusement park.

2

Create a historical simulation of the neighbourhood, trying to recreate what the whole street looked like 50 years ago, to show its development and vibrancy.



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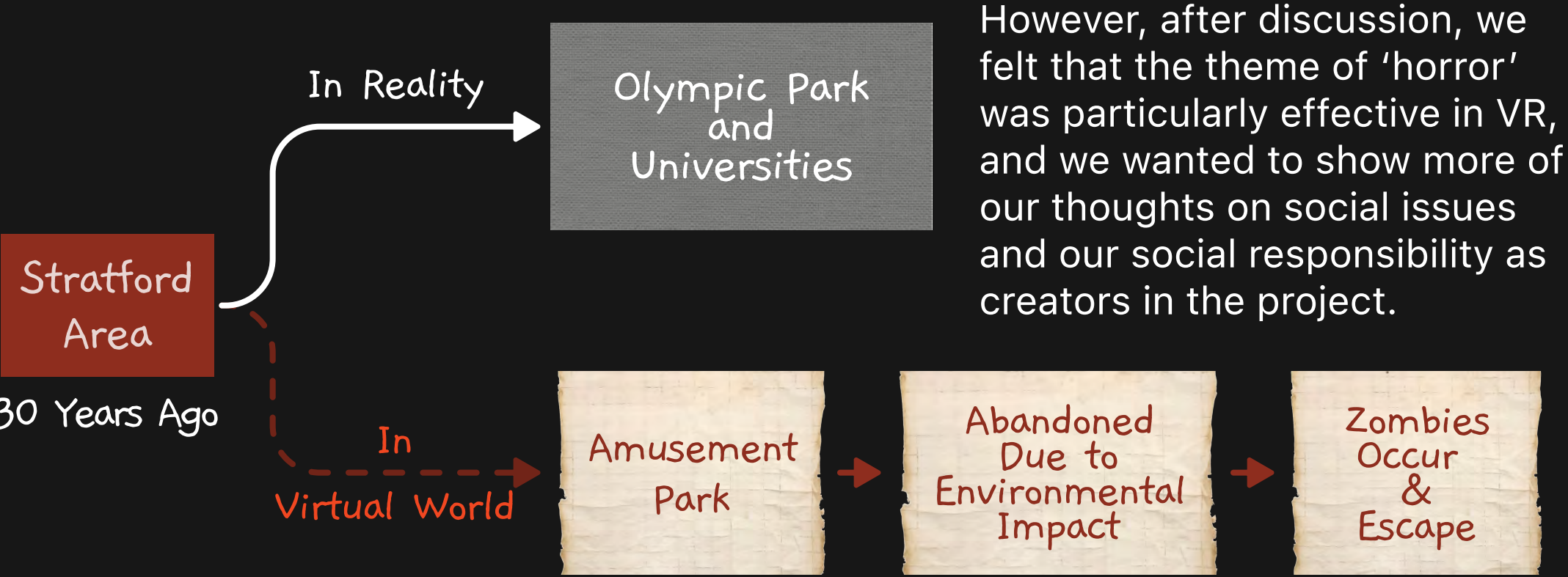


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So We decided to imagine a parallel world: what would have become of Stratford Amusement Park if the plans for the park had been approved, Olympic Park had not been built, and the park had been abandoned because of the environmental pollution and the huge costs it would have caused?

Through a **surrealistic representation**, we set up a post-apocalyptic setting for the VR project: the Olympic Park area becomes the abandoned Stratford Wonderland, and a lot of zombies are created. From a larger picture, the project hopes to build a **large-scale VR escape game** based on this, where players hide from zombie NPCs. In doing so, it reflects on the balance between human development and environmental protection.

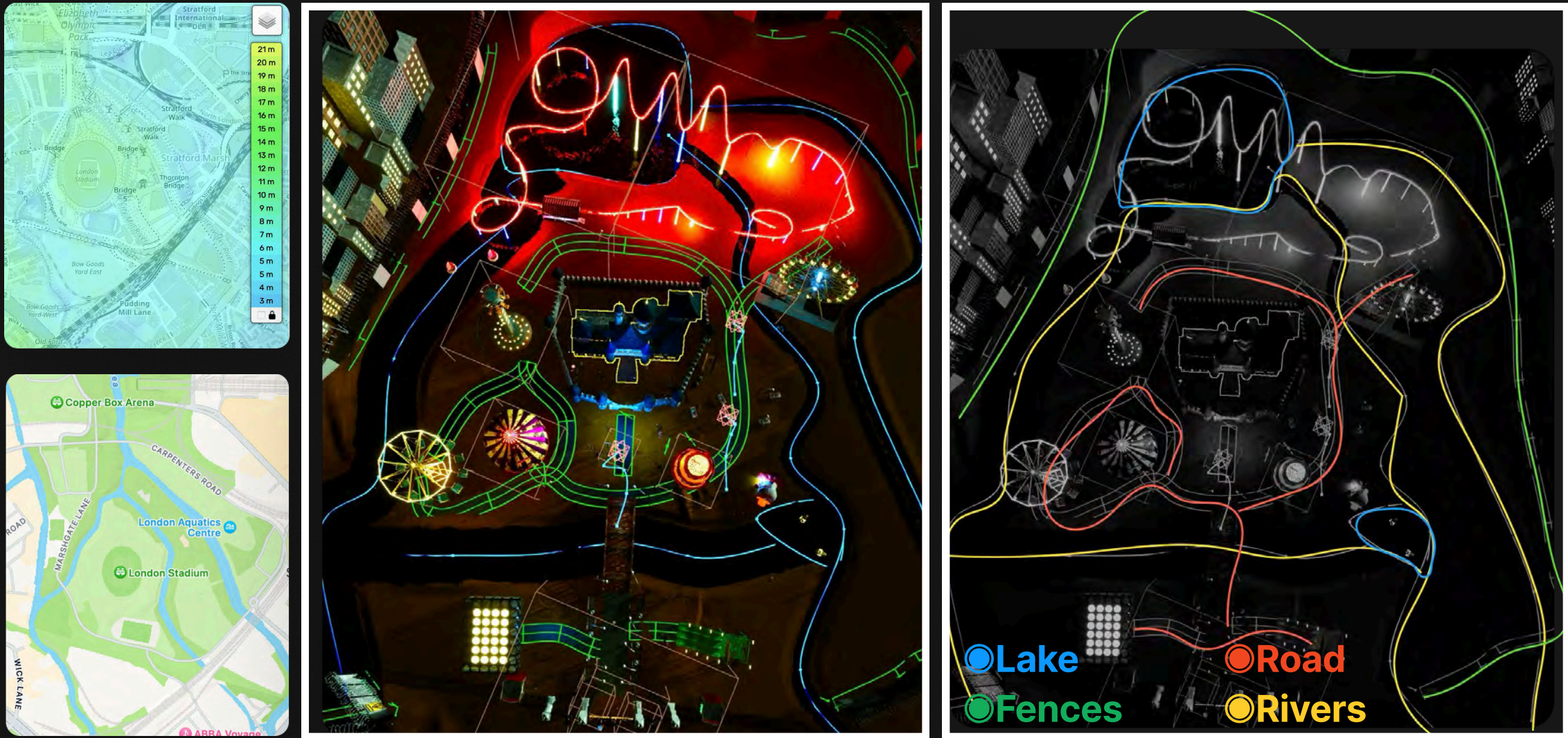


Game Design

LEVEL DESIGN

Community-based level design

As I wanted to highlight the fact that the project is based on the Stratford area, I decided to emphasise this by tying the real-life Stratford area's landforms to the game's map. Therefore, the terrain of this project has been carefully designed to have a topography that corresponds **exactly to the Stratford area of London**, including natural landscapes such as rivers and hills.



Stratford Area geography height-map, road map and game landscape

Based on this terrain, I also designed more facilities and roads on the map to further shape the look and atmosphere of the '**abandoned amusement park**'.

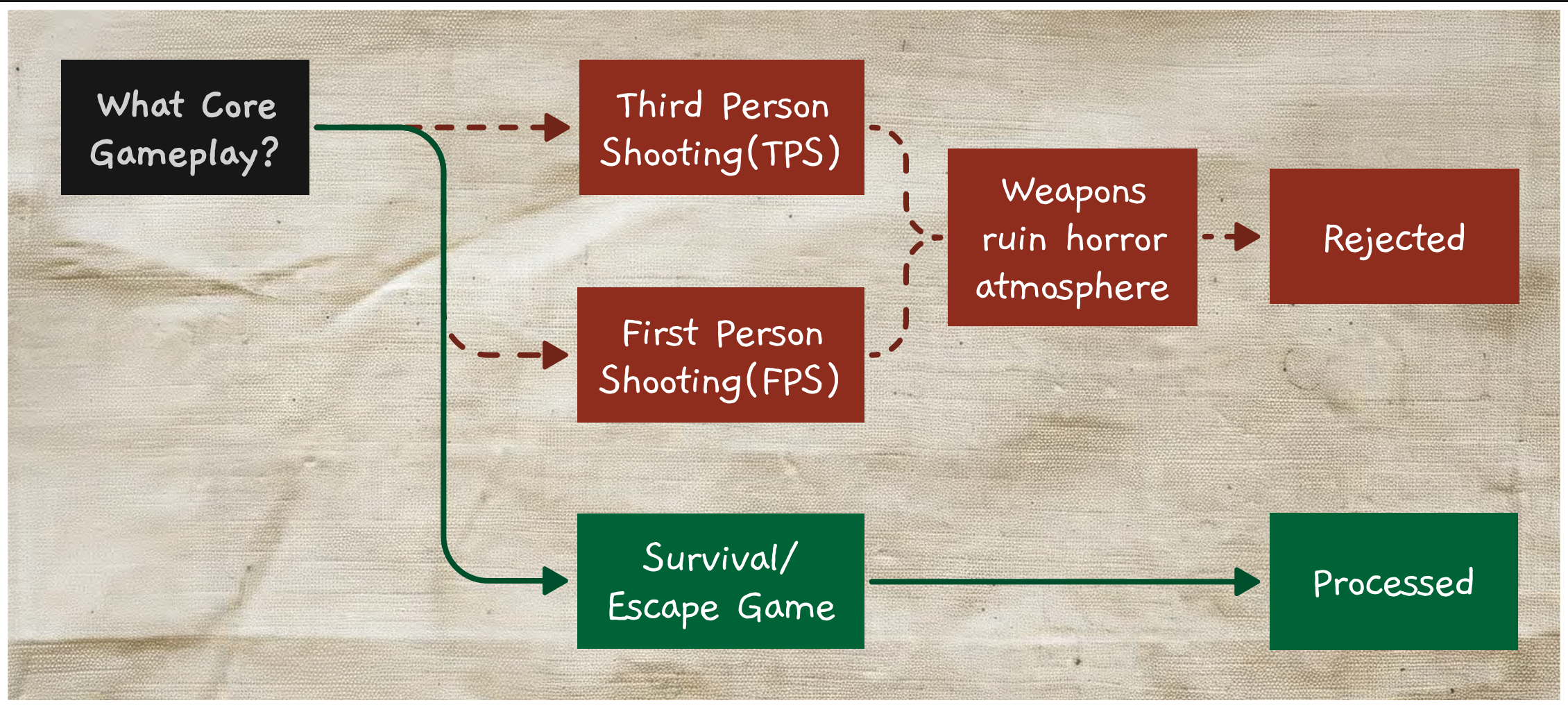
The terrain of this project consists of several important parts: fences, rivers, lakes and roads, which are all controlled by the splines in the landscape function of the unreal engine, and the terrain is assembled in a quick and easy way by importing the relevant models.

GAMEPLAY DESIGN

First-Person Escape Game with NPC

We considered making it an FPS/TPS game, but giving the player weapons would in itself ruin the game's shaping of the horror atmosphere. So in the end, we decided to make it an escape game and players have to survive in game for 5 mins.

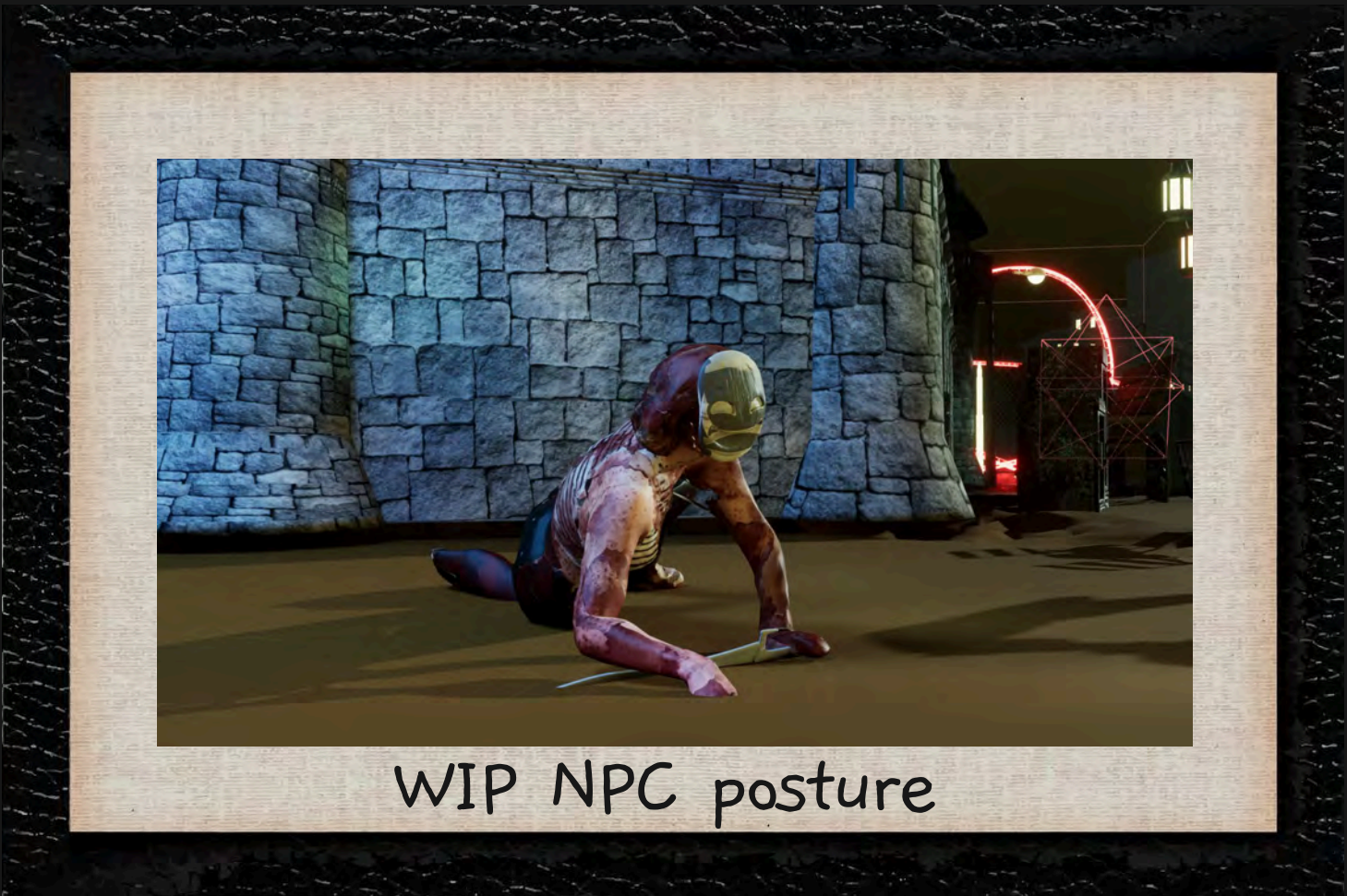
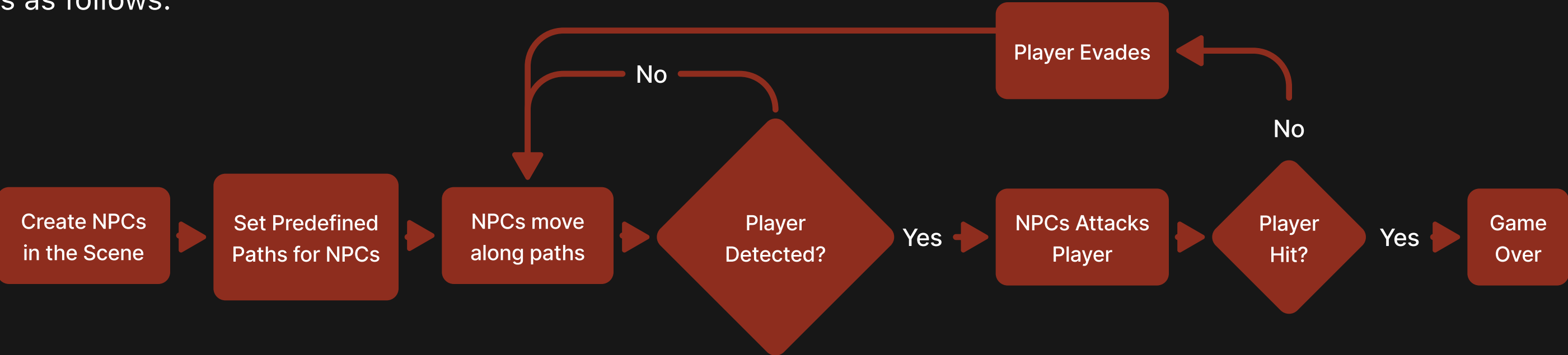
So NPCs were made in the scenario, and all NPCs in the scenario moved in set pathways and attacked the player. Any attack is fatal because the NPCs don't move very fast. The player needs to dodge the attacks. **The NPCs in the scenario are controlled via Blueprint.**



Game Design

NPC

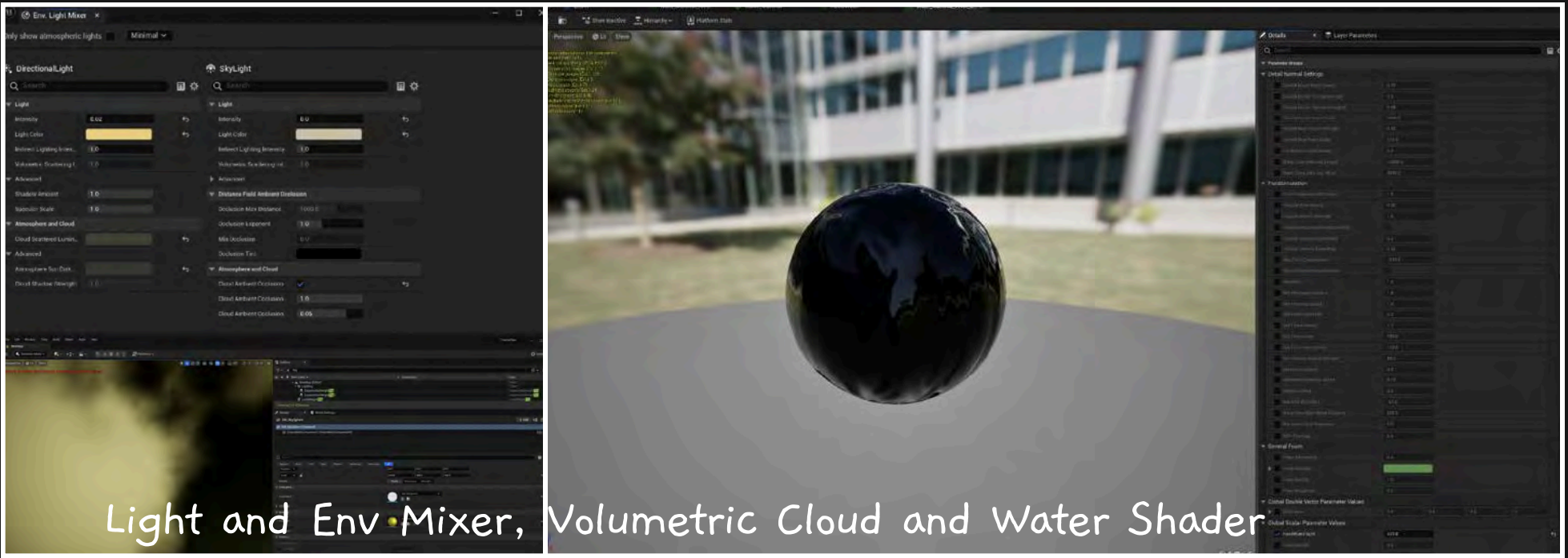
Because of the decision to make a survival game, the game includes **several NPCs in different poses and states that are driven by Blueprint**, whose models are made by 3D Scan and animated by Motion Capture (see later.) The logic of the NPCs is as follows.



LIGHT AND AMBIENT

Create Horror Polluted World with Light and Environment Settings

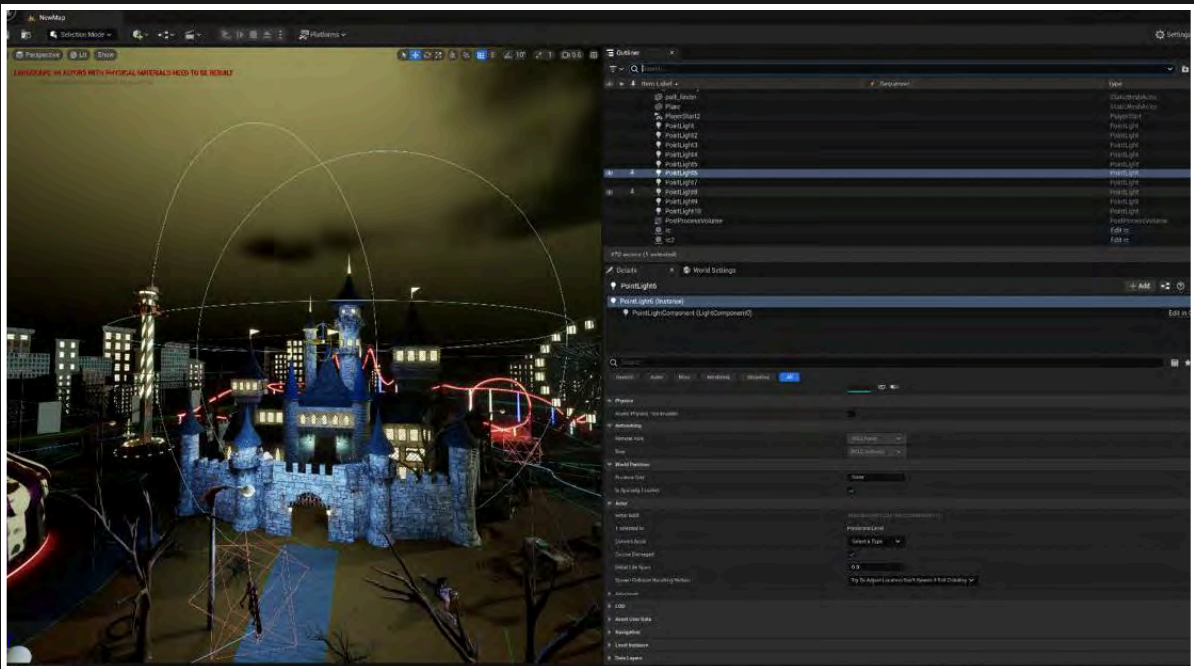
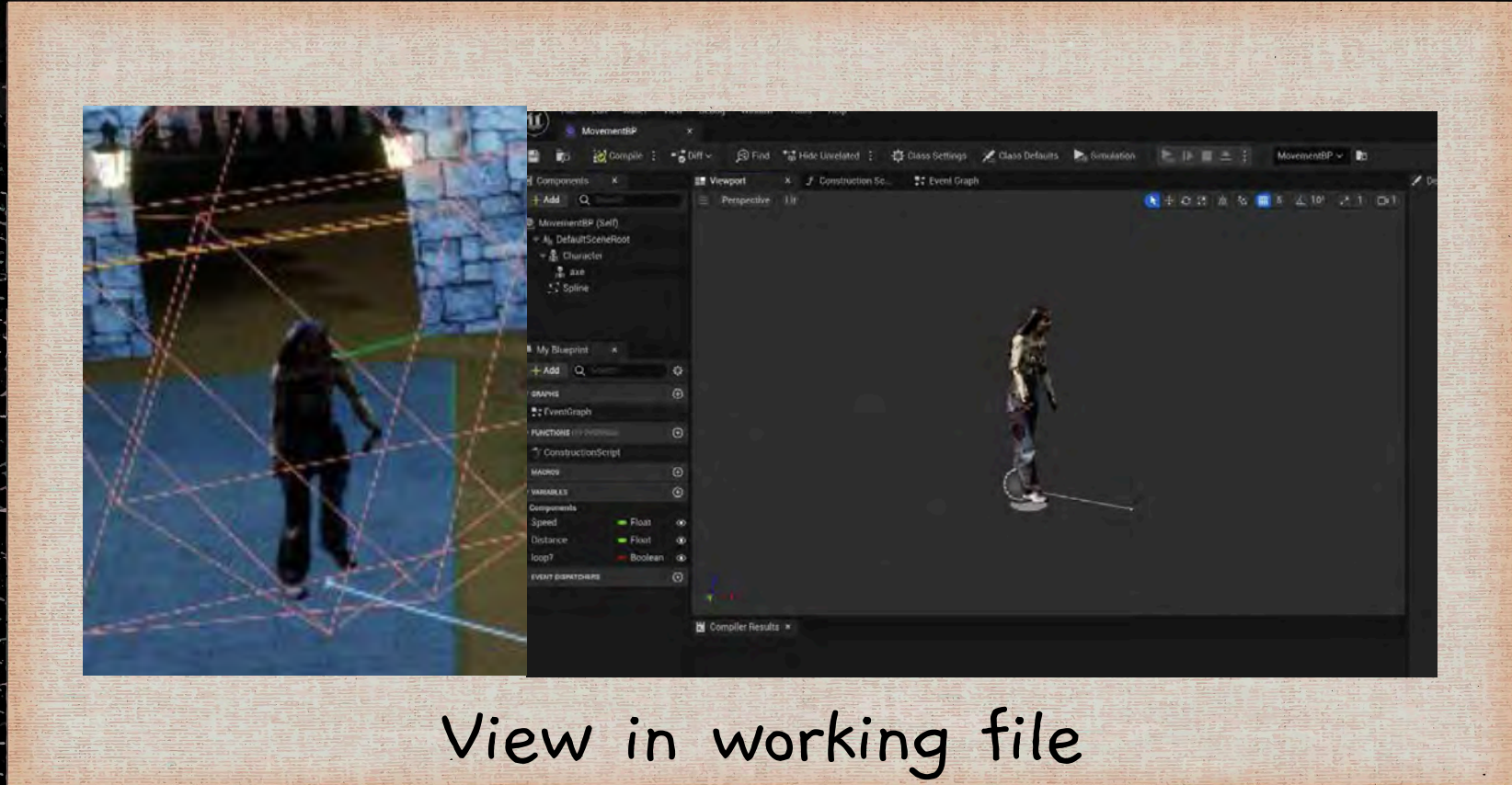
Lighting is very important to the horror atmosphere. Therefore in this project I made various attempts to set up the lighting. The first time we thought we could consider putting it in daytime or dusk, but we realised that the horror atmosphere of the amusement park would not be well shaped this way, so we chose to use a **darker scene** and combine it with some **emissive material** to create the whole world. Apart from the emissive material aforementioned, the project is lit through Environmental and World Setting, volumetric cloud, spot light and point light.



At the same time, by setting the Light and Env. Mixer, etc., we can highlight the settings where the ring has been damaged by setting the scene light and other settings. For example, the black water and yellow clouds in the game emphasise the environmental pollution.

Extra Light Settings

The scene also includes a number of real-time rendered point lights, which receive Blueprint's control and include a flickering effect to further the horror atmosphere



Game Production

3D MODEL SCAN

The game involves the creation of many NPC characters, and we realised the significant amount of work involved in designing and building mission models. So, we chose to **scan everyone on the team into 3D models** through 3D scanning, which were then further optimised and textured by the art's group, and finally put into the Unreal Engine by me to be **combined with the MoCap animations** to create high quality and scary NPC characters in the game quickly.

Me and my colleagues' Original 3D Scan Model



Final NPC in game



Use Lidar device to scan team members

Pipeline

Obtain Initial character models

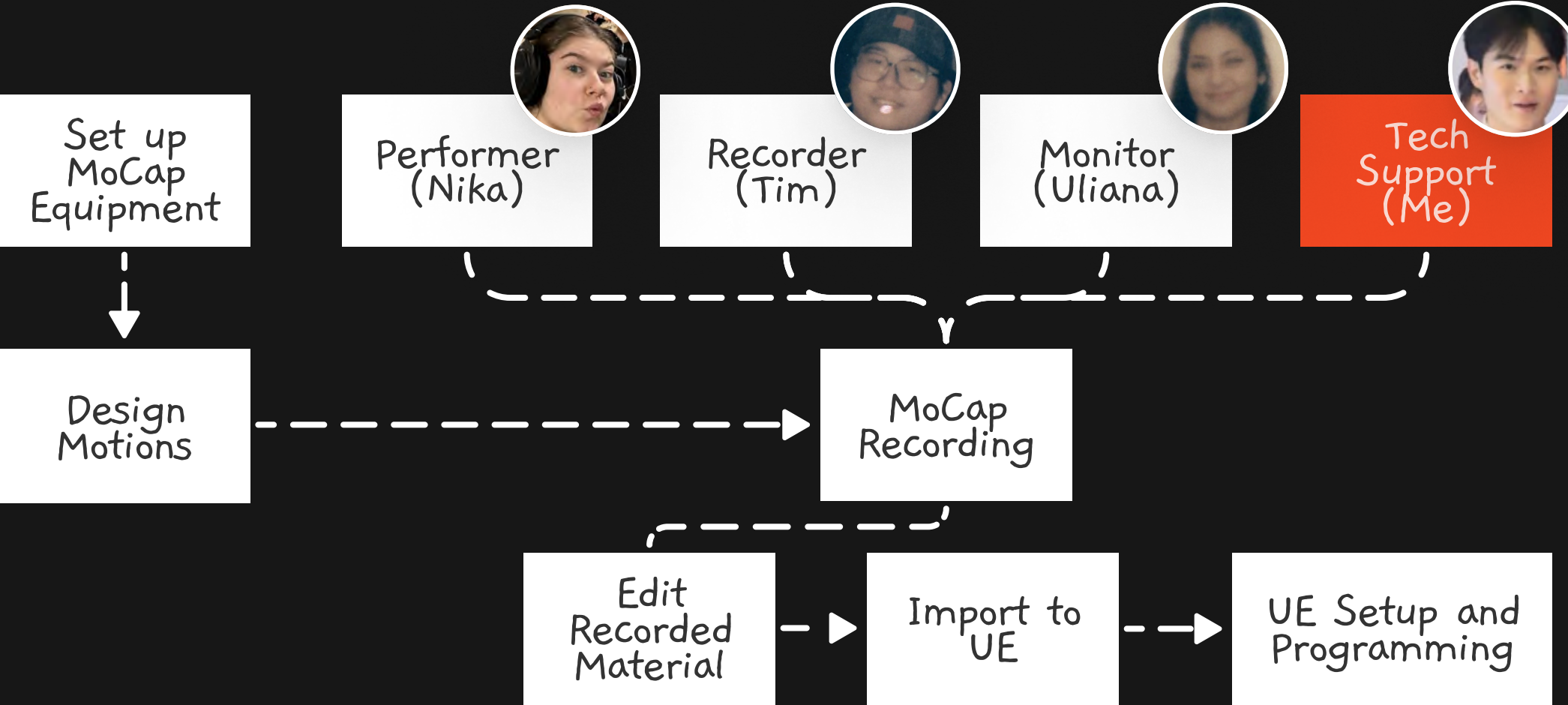
Further modification by art team

Add animations

Import into Unreal Engine

Integrate with animation blueprints

MOTION CAPTURE



The game requires zombie movements which **consist of many details** and therefore difficult to create directly in blender, so we used motion capture to create the animation part of the game. Two actor crew members played and acted as zombies, and then the animator did the post-production, and then I put it into the Unreal engine.



Game Production

UNREAL IMPLEMENTATION

Relatively speaking, the logic of this game is simple and straightforward. The main setup difficulty of the game is in the scripting of the NPCs, which is driven by Character Blueprint and the core logic of the game.

PROBLEM; HOW TO CONNECT NPC WITH WEAPON SOLUTION- SOCKET IN ANIMATION BLUEPRINT

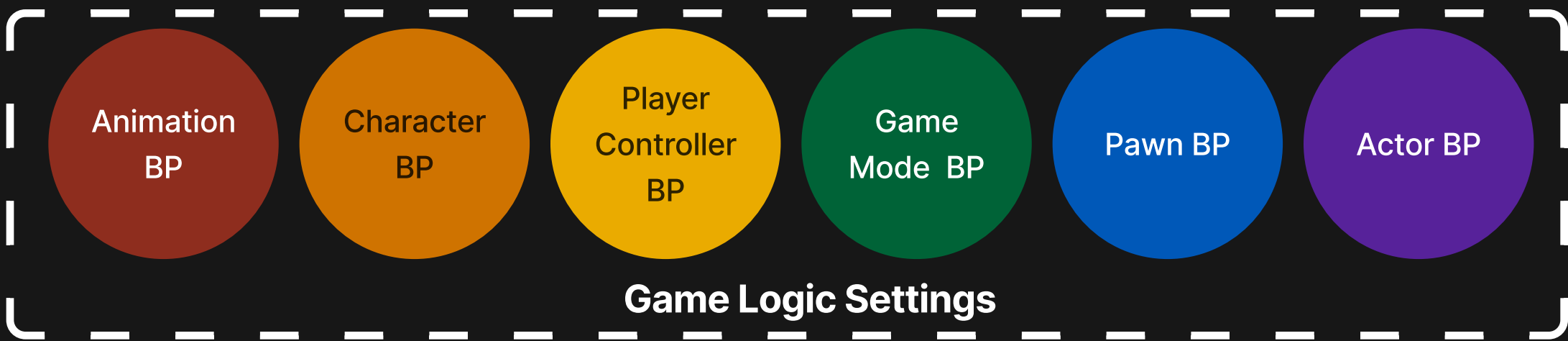
In this project, the animation effects of the characters are also realised through blueprints. One of the difficulties in implementing character animation is to make the character's weapon move naturally with the character's movements. I used the **socket function** to achieve this effect . The character animation is imported from Blender by using **root motion**, then the Animation blueprint is created, and finally, the Character blueprint is created, and the loop animation is used to visualise the NPC's settings in the project.



Character Move Along Spline
Character Blueprint Socket

NPC Character Blueprint

OTHER BLUEPRINT LOGIC



This project uses blueprints to drive all content, and it includes an **animation BP**, **character BP**, **pawn BP**, **actor BP**, **player controller BP**, and **game mode BP** made specifically for this game and using this BP to connect game with Meta VR headset.

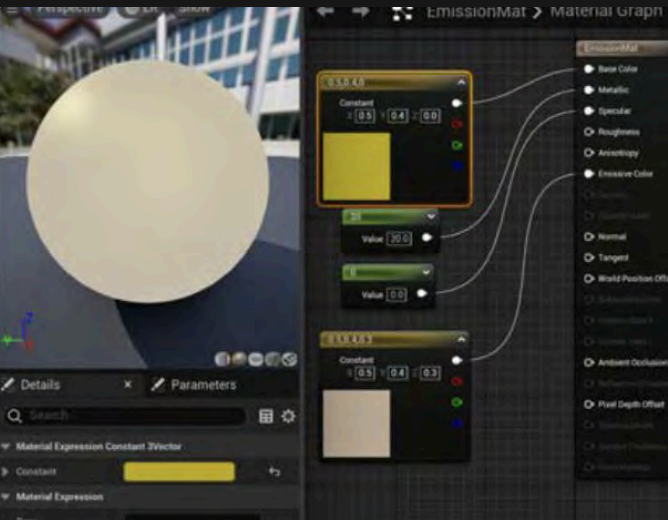
Game Production

MATERIALS AND VFX

This project utilises a number of particle systems, including the Clouds effect in the introductory section of the title and the Fly effect in the main project.

ENHANCE MATERIAL WITH NORMAL MAP

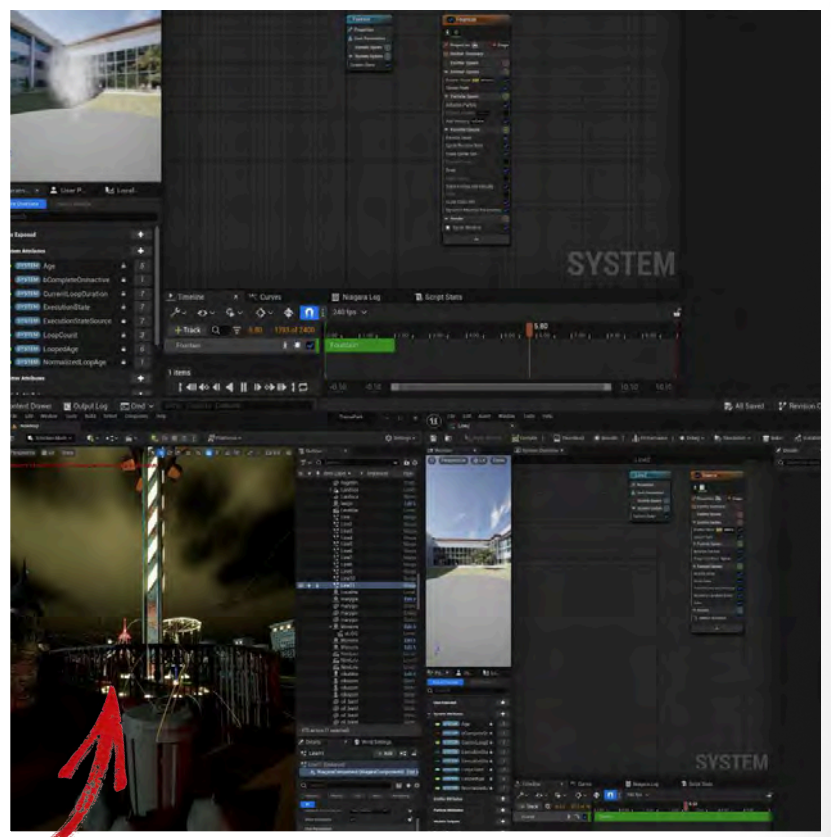
Many image materials are used when creating models, so many image materials are in the Unreal engine. However, we realised the pictures looked too flat and could produce reflections. We solved these problems by **increasing the roughness and creating a normal map** to make the image material look more realistic and detailed.



Emissive Material



Enhanced Wood Material



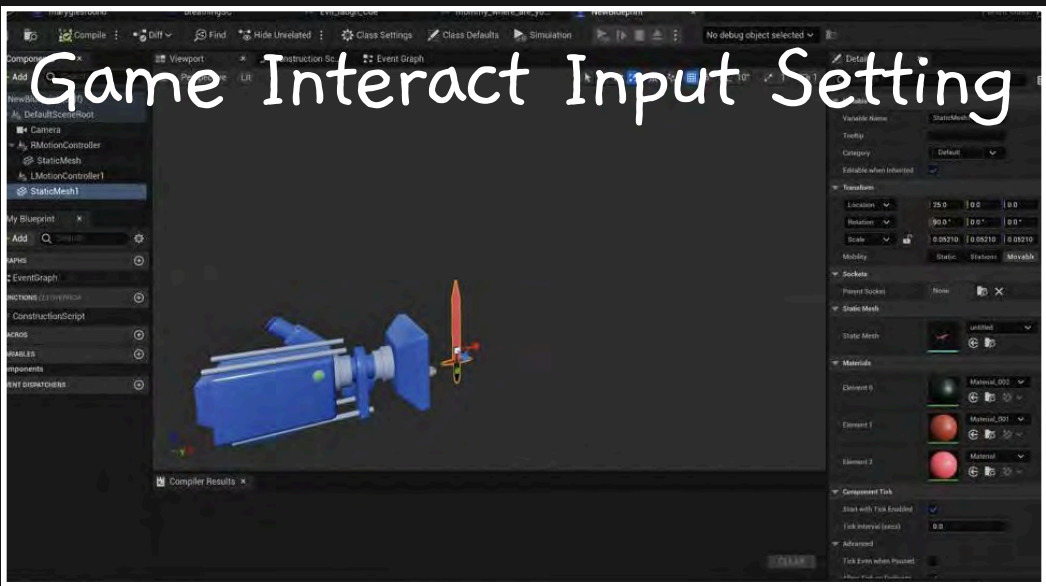
VR IMPLEMENTATION

Bring on the show

At the beginning of the game's design, we thought that horror games would have a very good presentation in VR, which is why Stratford Wonderland has a horror atmosphere.

The player can **view all the content** in Stratford Wonderland from all sides and **roam around in** it after wearing the VR glasses correctly.

All buildings in the game are set up with collision bodies and triggers; the player does not walk through walls or fly, but can trigger the music.



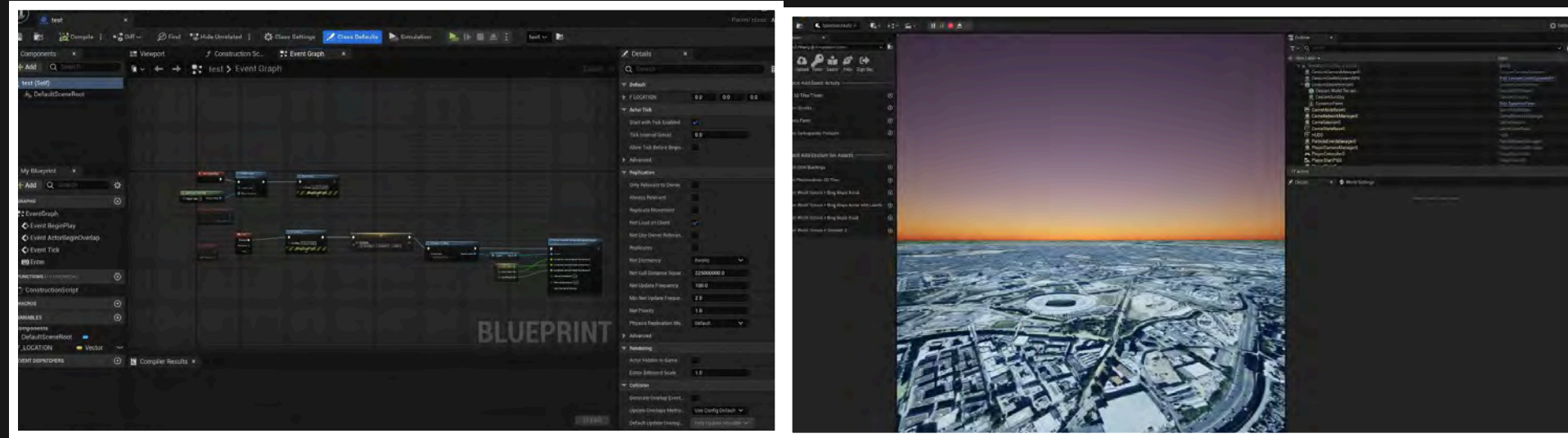
View in VR Headset



Player Playing with VR Headset

Project Polish & Further Development

USE CESIUM TO CONNECT REAL AND PARALLELED VIRTUAL WORLD



Cesium and Cesium Blueprint

After the game was completed, we realised that the game was created in a parallel world, so it would be difficult for the player to integrate it with the Stratford area. To solve this problem, we created a pilot film for the game, which is available via Cesium, a real map system based on the Unreal Engine. The Cesium plugin was used in the project for the introduction. With Blueprint, the player will fly from Beijing, China to London, ***creating a sense of "flight" that echoes the effect of travelling through the clouds afterwards.*** The exact coordinates of the Forbidden City and West Ham Stadium were passed into the blueprint to achieve the exact flight effect. Cesium was also used to realise the differences and variations in the Stratford area between the two parallel universes

TECHNICAL CONSIDERATIONS:

- Optimise VR performance ensuring cross-platform compatibility
- Simplify resource usage and reduce loading times
- Implement accessibility features like customizable controls and motion sickness mitigation options

FUTURE DEVELOPMENT PLANS:

- Create detailed narrative with compelling characters and plot twists
- Refine game mechanics focusing on exploration, puzzle-solving, and survival
- Implement complex NPC behaviors to increase tension and unpredictability
- Enhance visual fidelity and environmental details for an immersive experience

Final Presentation

