Project Logbook for Virtual Campus

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Table of Contents

[Signoff table and summary 2](#_Toc508652638)

[1 – Choosing a project theme 3](#_Toc508652639)

[2 – Research on project 3](#_Toc508652640)

[3 – Choosing and testing programs 3](#_Toc508652641)

[4 – Testing out Unity 3](#_Toc508652642)

[5 – Testing out SketchUp 3](#_Toc508652643)

[6 – Choosing movement type 3](#_Toc508652644)

[Teleport based movements 3](#_Toc508652645)

[Free movement 3](#_Toc508652646)

[Waypoint movement 3](#_Toc508652647)

[Conclusion 3](#_Toc508652648)

[7 – First initial prototype 3](#_Toc508652649)

[8 – Importing terrain 4](#_Toc508652650)

[9 – Restarting again 4](#_Toc508652651)

[10 – Adding terrain 4](#_Toc508652652)

[11 – Photoshoot of buildings 4](#_Toc508652653)

[12 – Texturing of the ground 4](#_Toc508652654)

[13 – Adding in movement 4](#_Toc508652655)

[14 – Adding in central buildings 5](#_Toc508652656)

[15 – Creating Lake 5](#_Toc508652657)

[16 – Adding in voices 5](#_Toc508652658)

[17 – Implementation of adding voices 5](#_Toc508652659)

[18 – First build of the project 5](#_Toc508652660)

[19 – First demo of the project 5](#_Toc508652661)

[20 – Importing to GitHub 5](#_Toc508652662)

[21 – Adding trees to campus 6](#_Toc508652663)

[References 7](#_Toc508652664)

Signoff table and summary

|  |  |  |
| --- | --- | --- |
| Date | Summary of date/week | Signature |
| 18.09.17 | Choosing project theme |  |
| 10.10.17 | Research on project |  |
| 13.10.17 | Choosing and testing programs |  |
| 16.10.17 | Testing out Unity |  |
| 18.10.17 | Testing out SketchUp |  |
| 20.10.17 | Choosing movement type |  |
| 6.11.17 | First initial prototype |  |
| 17.11.17 | Importing terrain |  |
| 20.11.17 | Restarting again |  |
| 21.11.17 | Adding terrain |  |
| 30.11.17 | Photoshoot of buildings |  |
| 4.12.17 | Texturing of the ground |  |
| 11.12.17 | Adding in movement |  |
| 8.1.18 | Adding in central buildings |  |
| 18.1.18 | Creating Lake |  |
| 25.1.18 | Adding in voices |  |
| 26.2.18 | Implementation of adding voices |  |
| 8.2.18 | First build of the project |  |
| 15.2.18 | First demo of the project |  |
| 19.2.18 | Importing to GitHub |  |
| 26.2.18 | Adding trees to campus |  |

# 1 – Choosing a project theme

# 2 – Research on project

# 3 – Choosing and testing programs

# 4 – Testing out Unity

# 5 – Testing out SketchUp

# 6 – Choosing movement type

To choose the movement type of moving around the virtual campus, I had to research the possible types of movement in virtual reality. The three movement types that interested me were:

1. Teleport based movement
2. Free movement
3. Waypoint movement

## Teleport based movements

## Free movement

## Waypoint movement

## Conclusion

# 7 – First initial prototype

The first initial prototype of the first program was basically me trying to test out unity’s Virtual Reality features as well as exporting to android devices. The first scene allowed you to view a house, move your head around the environment however you weren’t allowed to move because it wasn’t implemented yet. It also had interactivity as you could press a button on the house which played an audio clip. Originally the virtual campus was going to be exported to Windows.

# 8 – Importing terrain

To import the terrain, Tim Threadgold helped me import the terrain by using a website (Darrenlloyd, 2013), that allows you to create terrains from Google Maps by creating a heightmap for photoshop. Tim Threadgold helped me by sending me the files of the heightmap as I lacked Photoshop (As the website uses the photoshop scripts to create the terrain’s heights) to create the heightmap for the terrain.

Once the files have been imported into Unity, then I created a terrain and imported the heightmap into it, thus making the terrain of the campus. Despite how easy it sounded on paper and I was well ahead of finishing the Virtual Tour of campus, a problem occurred.

# 9 – Restarting again

Despite easily importing the terrain into the initial Whiteknights campus Terrain, there was a major problem with the initial terrain, the terrain was too big for the entire campus and there was a lot of issues rendering all of the terrain and the shadows. It took too long to render not to mention if this is the issue of rendering every detail of the campus on my PC. Then chances are that my phone will not be able to render correctly when exported to android devices. So thus, the decision was made to restart the entire campus terrain from scratch and recreate it again.

# 10 – Adding terrain

Adding in terrain after restarting the entire campus again, was simpler and easier to render and build on my computer than the previous incarnation. To build the campus grounds again, I did a 3 by 3 square grid consisting of different terrains. So, it would be easier to paint pavements into the terrains. I based the terrain’s positions based on Google maps, facing east.

# 11 – Photoshoot of buildings

To get referencing of what the buildings around Whiteknights campus and to somewhat accurately model the buildings. I decided to go to Whiteknights campus in real life and took photos of the various buildings that I intend to model inside the virtual campus. All of the photos I took for referencing can be found here: <https://drive.google.com/drive/folders/1eXYKl3vXmljyhCB6fUtWI806828mBcG4?usp=sharing>.

# 12 – Texturing of the ground

To texture the grounds of the campus, I used the terrain painting tool in unity. First, I had to add in a base texture, which I used Unity’s standard assets for the grass texture which paints the entire terrain in grass, (as most of Whiteknights’ campus is grassy). To add pavements in campus, I used a paintbrush tool to paint directly onto the terrain. The texture used to make the pavement was from (Nobiax, 2014). I painted the pavement based on google maps’ satellite view.

# 13 – Adding in movement

To add in movement, I followed a YouTube tutorial (BrainSock, 2016) to add in teleport based movements, most of the code was already done by the tutorial and I used the prefab that he had provided already into the existing project. I have tweaked some of the code to make it easier for the user (Such as making the line bold).

# 14 – Adding in central buildings

To add in the central buildings, I have created and texturized every building using SketchUp. After each building was created, it was exported in a .skb file in order for it to be used in Unity. Afterwards the buildings are imported to unity and then placed inside the Virtual Campus, the buildings were placed in positions according to Google Maps.

# 15 – Creating Lake

To create the lake in the campus, a terrain was created first, to sculp the terrain, I had to change the terrain height (Terrain height is defaulted to 0, you can rise terrain however you cannot lower terrain which I wanted to do). Then sunk the terrain to make the lake, afterwards to add in the water, I imported the environment standard assets from unity and then I added a Water prefab into the lake, by placing it in the areas where the terrain has been lowered and thus creating the lake.

# 16 – Adding in voices

I have added in voices, using a microphone and following a script that I have created. All audio was recorded using audacity.

# 17 – Implementation of adding voices

To successfully implement voices into the world for when the user wants to find out the history of the building. A button was created next to the buildings then when the user walks up to the button and presses it, then the sound clip will be activated playing the voice. To achieve this, the button was first created along with coding of what sound clip will be played when the button is pressed, afterwards the button is then added to world (It is usually defaulted to the User Interface) and then afterwards the button is placed next to the assigned building.

# 18 – First build of the project

The first build of the project was made using the Unity build settings. The settings exported was using Android, 32 bits and was built for nougat devices or higher (7.0 or higher). As older versions of android won’t be supported as they do not have daydream or cardboard installed (the service to run virtual reality on Android devices).

The first build was successful as it suffered no errors and bugs during launch and everything ran fine according to how it was built.

# 19 – First demo of the project

The first demo

# 20 – Importing to GitHub

I have imported the entire project into GitHub (In hindsight, this should have been done earlier however due to previously having a lack of knowledge and not feelings like I should use it, is the main reason why I didn’t use it until 19th February). The link can be found here: <https://github.com/JamesTang2905/Individual-Project-2017-18>

# 21 – Adding trees to campus

I have added trees from unity using the tree tool in the terrain settings. I have place trees based on the position of google maps.

# References

BrainSock, 2016. *Revit to Unity : Adding Google VR & Teleport.* [Online]   
Available at: https://youtu.be/JbkYLfdHwbg

Darrenlloyd, 2013. *Heightmap creation from OS data. (UK Only).* [Online]   
Available at: http://r3dstar.co.uk/?p=231

Nobiax, 2014. *Yughues Free Pavement Materials.* [Online]   
Available at: https://assetstore.unity.com/packages/2d/textures-materials/brick/18-high-resolution-wall-textures-12567