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KC3289

Virtual Reality Technical Report

Assignment 2

Virtual Space

Semester 2 Year 2

BA Digital Arts

Word Count: 1511

Virtual Reality Technical Report

Introduction

This report:

- a) Discusses the technology used.
- b) Discusses the problems that occurred and how they were resolved.
- c) Discusses the future of the project.

Background

An artifact demonstrating the fairytale Hansel and Gretel in a virtual environment. This will be aimed at children 7 years and older.



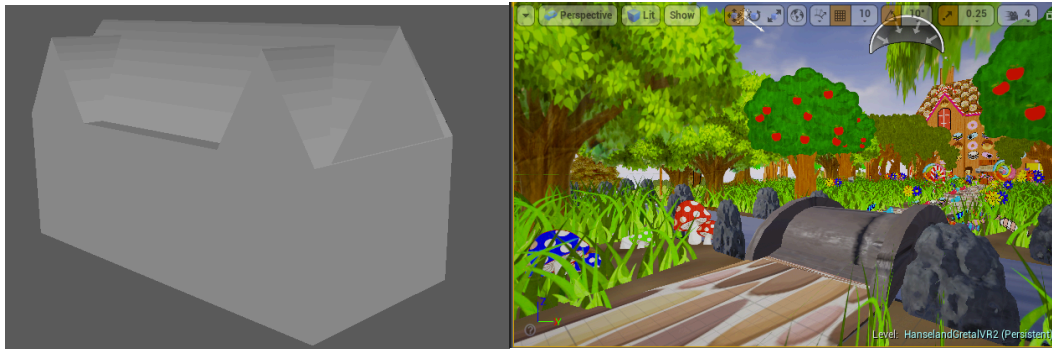
Technology and Software

This project was created in Unreal Engine. I used a template in Unreal Editor where various assets were uploaded to create the environment.



Images

Initially I decided to create this environment using 3D images. I created the house in Maya and though I was pleased with the results it did not fit my brief of having an environment that would be visually appealing and easy on the eye for a younger audience. I also felt that it would be easier to navigate the 3D environment making the interface a more natural experience if 2D images were used. I decided to create images in Photoshop and Illustrator, which were then converted to a cardboard effect. These images were overlapped to create an illusion of depth and space providing perspective in establishing size and distance. To meet the deadline, 2D images were also more realistic to use.



Assets

Some were created in Photoshop, Illustrator and Maya. Others were taken from the internet and some were taken from the assets in unreal engine.

Photoshop: House, sweets, flowers, well, trees, bushes, cage, flower pots, Hansel and Gretel

Butterflies- I created two versions, one with closed wings and the other with open wings. Two sprites were created then uploaded into the *flip book* of unreal engine to create an animation. The *Matinee* function was used to animate them and have the butterflies fly around the environment.

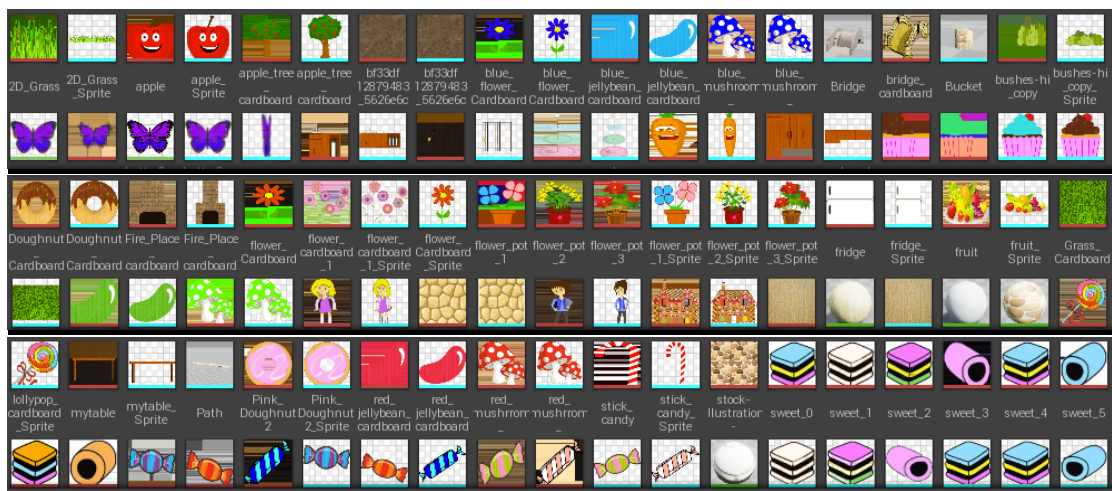
Illustrator: Cupcakes, doughnuts

Maya: Path, bridge, bucket

Unreal Engine: River, fire, smoke, water, internal kitchen

Internet: Trees, kitchen cupboards, fridge, grass, table, witch

I took the assets of the water, fire and smoke from the *particles* to create a life like effect to enhance the experience as these immerse you further in the environment because of their movement and provide a surprise experience.



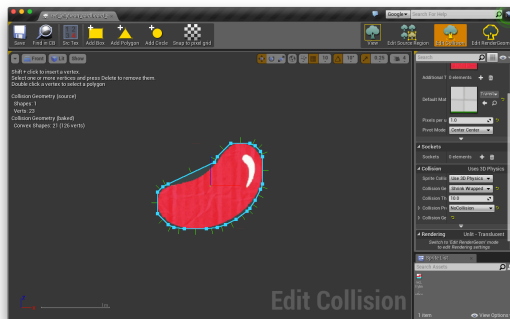
Sky lighting: This was used to enhance the sky's appearance and also ensure that its lighting and reflections matched so the viewers experience was as natural as walking through an actual forest.



Navigation

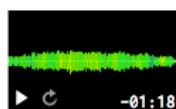
The arrow keys on the keyboard are used to navigate the environment. The head mounted display will enhance the experience by allowing 360 degrees viewing creating a sensation of 'presence,' therefore feeling the viewer is actually present in the fairytale.

I had to ensure that *no collision* was set so the environment could be navigated without being blocked.



Audio

The soundtrack was taken from the internet. I converted it to a wav. File. It was then uploaded into unreal engine and using the *create cue* function a blueprint was created and the sound added.

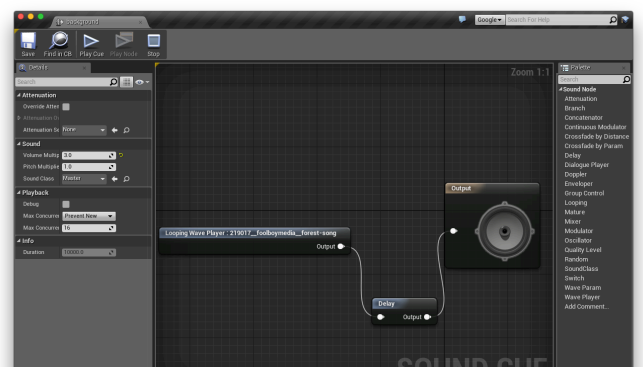


Forest Song



A short track (can be looped) that I felt would be ideal for background music in a forest setting, in ...

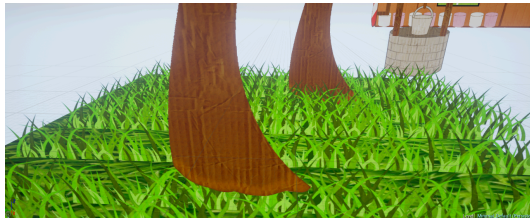
calm wind instrumental fairy telling village forest woods fantasy pixie fiction trees video-game



Feedback

Grass was initially placed in rows but was advised to criss cross these strips to provide a less dizzying experience.

Ensure the environment is full to provide a more immersive experience.



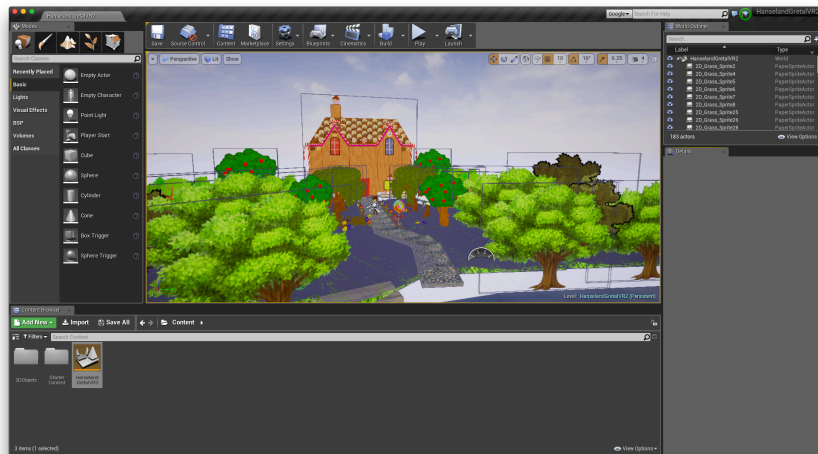
Before



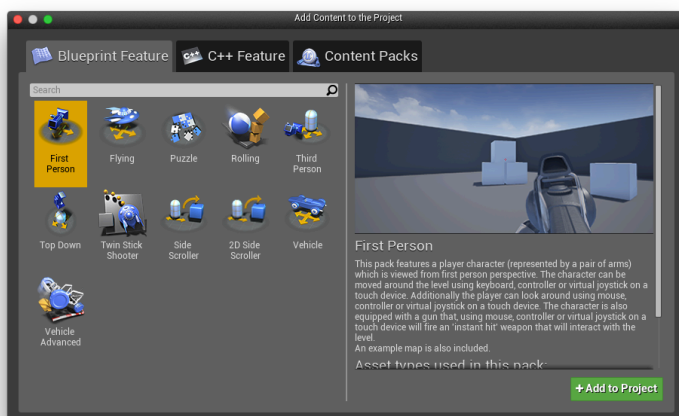
After

Problems Occurred Whilst Creating Project

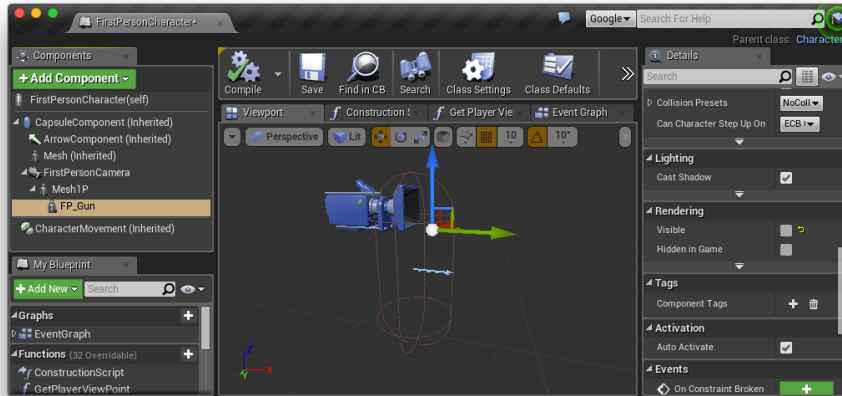
1) Whilst working on the project the screen froze placing purple rectangles over all the assets. The project had crashed and I could not continue. Even reloading the unreal engine tool did not fix the issue. Having previously saved the work on my hard drive I opened up unreal engine on another computer. The project worked. After much research I found by giving the project a different file name it would activate and work again on the original computer. This was done and proved successful.



2) I originally created the project using a blank template but when I went to create the blueprint to enable the head mounted display it was not visible. Research showed that by using the first character template by default provided the correct blueprint. Initially I thought I would have to recreate the environment in the first character template but after more research I found that by selecting add feature or content pack to the Add New in the content browser and then selecting the first person pack my project was transferred. I was now able to use the default blueprint. (Unreal engine, 2015)



3) After transferring to the first character template I needed to delete the gun and arms. Research showed these needed to be hidden. To do this I unticked the *visible* button in the *panel scroll* in the first person character blueprint for both the arms and the gun.



4) Initially the path was created from the cube in the basic menu and the cobble stone material was added from the material menu. This created a 3D path but where the cubes were overlapping flashing occurred. Instead I created the path in Maya and downloaded a texture. When added into unreal engine it stopped overlapping and flashing.



Before



After

5) Though I managed to add one line of text, every time I tried adding another line of text to a different part of the environment the original text would be deleted. This requires further investigation as to how to add the written words of the story successfully.

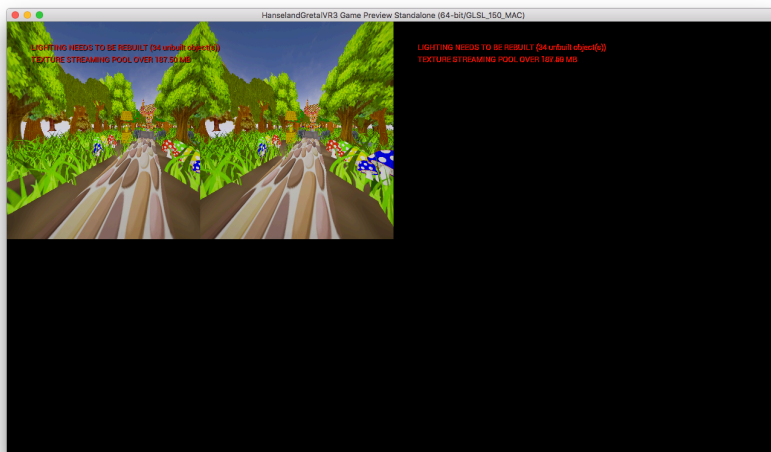
Head Mounted Display Blueprint

The blueprint was set up to enable the Oculus rift to work with my VR environment.



Testing

Throughout the creative process I viewed the project using the Simple HMD function and VR preview in Unreal engine.



After testing using the Oculus I found the images were too big. I had to decrease the size by about 25%.



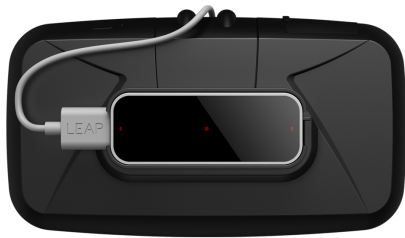
VR Best Practices

Simulation Sickness- VR best practices advise to have the correct FPS for your head mounted display and therefore have changed the default setting from 35 FPS to 75 FPS for the Oculus Rift DK2. This improved the viewing experience as it slowed down the navigation. Previously it was working to quick creating a blurry environment and a dizzying experience.

Base Eye Height Camera- VR best practices advise changing the default camera setting from 64 to 160 to compensate for the characters eye level. This improved the scalability of the project. (Unreal engine, 2016)

Future

With more research and time my aim would be to make the fairy tale environment more interactive. I would investigate integrating motion controllers, for example the leap motion controller to allow the viewer to grab the sweets or swipe at the butterflies or pick apples off the trees in the project. Interactivity would also allow opening the kitchen cupboards and fridge and removing items from inside them. (Unreal engine, 2015)



I would create the grass using a mesh rather than as 2d sprites so it could have a wind effect applied using the *Simple Grass Wind* function in the *World Position Offset* function and make it more real life.

WorldPositionOffset Functions

The following is a list of all the functions underneath the WorldPositionOffset category.

SimpleGrassWind

The **SimpleGrassWind** function applies a basic wind operator to foliage, giving the ability to specify a weight map and wind strength. This is a non-directional wind that just gives a very general movement to foliage. This should be the last WPO node you add.

Item	Description
Inputs	
WindIntensity (Scalar)	Controls how much the wind affects the mesh.
WindWeight (Scalar)	This is a grayscale map that controls how much the mesh's vertices will respond to the wind.
WindSpeed (Scalar)	This controls the speed of the wind.
AdditionalWPO (Vector3)	Takes in any additional world position offset networks or functions.



The environment at present can be navigated freely, but to develop the project further I would integrate trigger events so that the narrative can be followed as the story unfolds. For example once the house is entered you cannot come back out but have to follow through to the next stage of the fairytale. I would investigate using trigger events inside the blueprint level to do this. I would also want a time limit on the different parts of the environment so the young viewer does not stay in the VR environment longer than necessary. I would consider creating a loop system whereby a time limit is placed and once that has passed the viewer is automatically taken to the next part of the narrative.

Conclusion

My project worked as anticipated. However there were parts of the proposal that still need to be fulfilled and with more time and research could be implemented. For example enhancing the environment with more sound effects or have the fire blaze with more force as you approach it. It would be interesting to see what other particles unreal create as VR progresses. I would also anticipate how to add the full text of the story in the VR environment and maybe even have a narrator. I would also like to complete the project by creating the complete fairy tale.

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