CS24320 – Applied Graphics Resit

Contents

Introduction

My idea for this project was inspired by how I got lost this year in the Llandinam building. I wanted to create a short music video where someone goes into the Llandinam building and it becomes a space void/maze that they can't get out of. They then start to fall before landing safely and running to a portal back to the real world.

The music is royalty free piece titled Villainous by David Fesliyan[1]. All the other assets were created by myself from scratch in Blender or Gimp.

Gimp

Photo

For the photo editing part of the project, I took this photo of a bridge in Dublin, Ireland, and edited in gimp. As my project is a very cartoony style, I realised that there was no way to integrate a photorealistic picture into it in a way that made sense. What I decided to do instead was to use the photo as a colour reference inside of blender for the portal that would appear at the end of my project. To do this I first sharpened the image and increased the contrast (figure 2). Then I added a new layer which I coloured yellow, and then set it to colour dodge and lowered the opacity (figure 3). Finally, I added noise (figure 4) and I pixelized the image (figure 5), and then increased the saturation and brightness of the colours once more (figure 6).

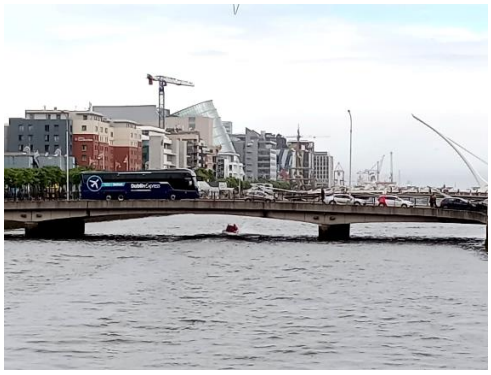

Figure 1 – Photo of Dublin, Ireland

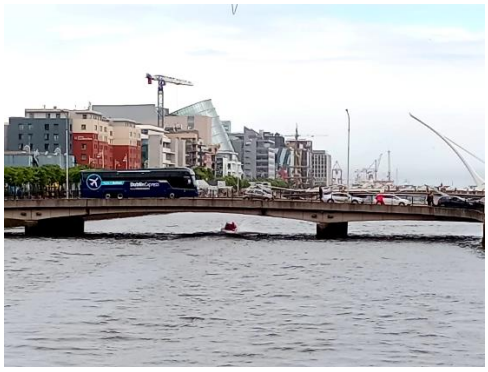

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Textures

For the textures, most of them were generated within blender, however I did touch up my character's face and clothes in Gimp. I exported the UVs as images, as well as some base textures that I had painted using the texture paint tool in blender, and then I added new layers and drew on them in Gimp to get the desired effect.

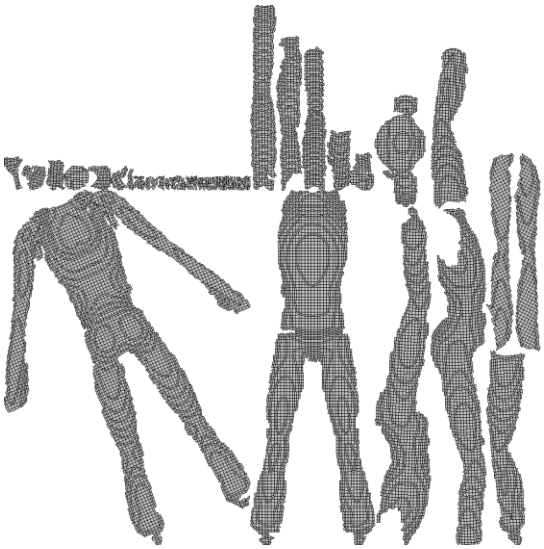

Figure 7 – character mesh UVs

Figure 8 – Texture as drawn in blender

Figure 10 – texture drawn in Gimp

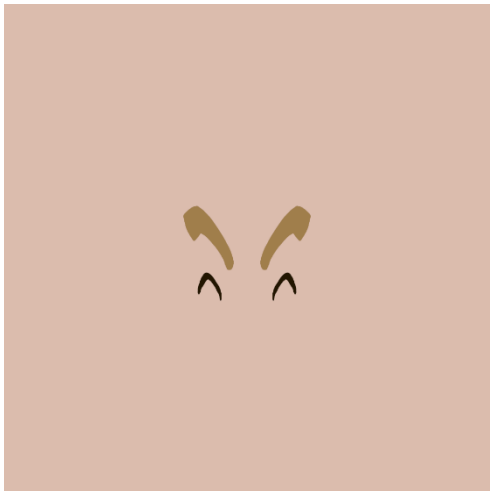

Figure 11 – Face texture as drawn in Gimp

Modelling

Line art

I was heavily inspired by the anime RWBY[2] to create a thick black outline around everything in my project, I wanted a really cartoony style. I found a tutorial on YouTube which I explained how to do this simply[3]. Essentially, I created a black emission shader with blackface culling and applied it to a solidify modifier that was flipped.

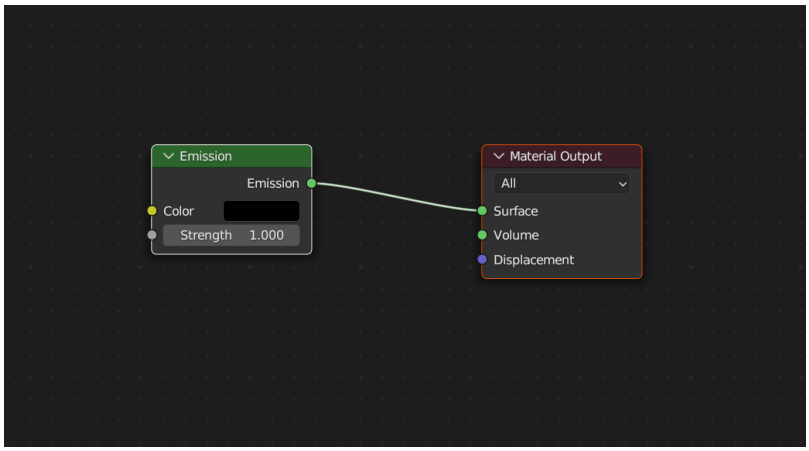

Figure 12 – Emission shader nodes (portal.blend)

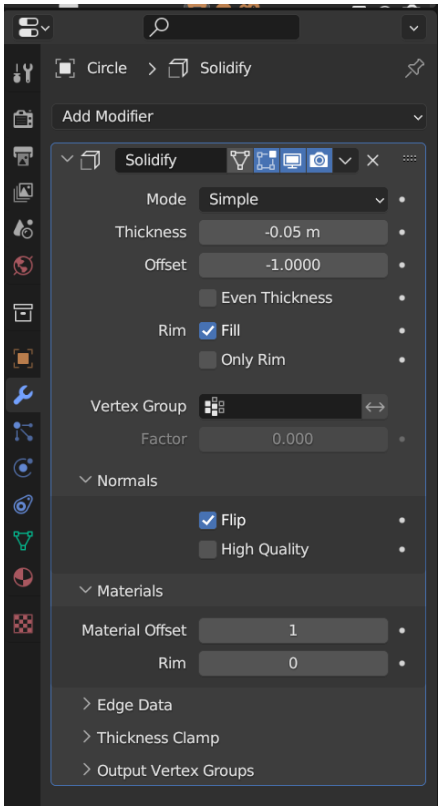

Figure 13 – solidify modifier (portal.blend)

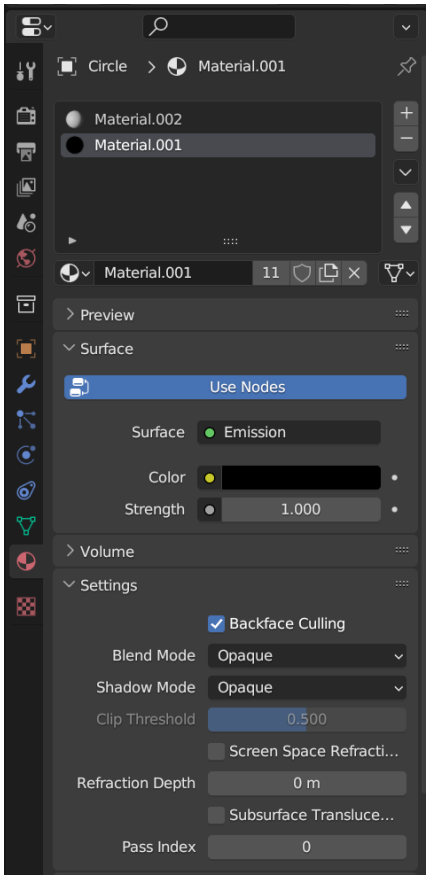

Figure 14 – material tab (portal.blend)

Character

I was heavily inspired by Disney's Vanellope from wreck it Ralph[4] and the art style from drifting home[5] for the style of my character.

I was heavily inspired by Disney's Vanellope from wreck it Ralph and (blank) from drifting home for the style of my character. I also knew that I wanted to add a black outline like in Rooster's Teeth's anime, RWBY.

I drew a few versions of the character by hand, before starting to model in blender. I used a basic cube which I extruded, to make the basic shapes of the body, and then I went into sculpt mode and did my best to make a somewhat human-looking character.

I made the hair using blender's curves feature- a curve can be bevelled and tapered in a way that works well for hair. Although I learnt how to do this from a YouTube tutorial, it was about ten years ago and I can no longer find the video I learnt it from. All of the hair shapes I used and the settings for the curves are in figures 15 and 16.

I will admit that when it comes to character rigging I probably could have done a better job. I created a basic rig, with IK bones for the hands, feet, and behind the shoulders. In an ideal world the IK bones would move with the root bone, however I thought it would be fine at the time and just had to work around it when it came to animation.

The eyes have their own rig system which I joined to the main armature after I'd gotten it to work. They are made up of two bones with have a damped track constraint to two more bones which represent where the eyes are looking. Originally I had both of the eye bones looking at one bone, but because of the anime style of the model and the size of the eyes, it didn't look right and I decided to animate both of the eyes seperately.

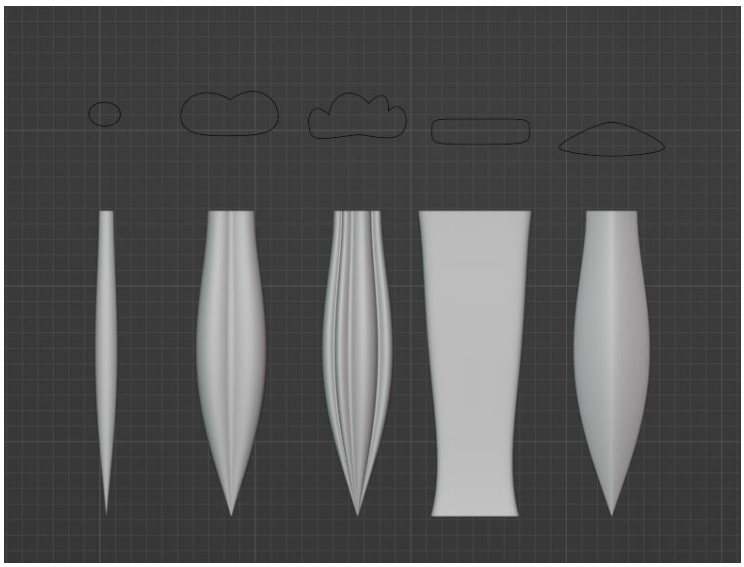

Figure 15 – Hair curves (character.blend)

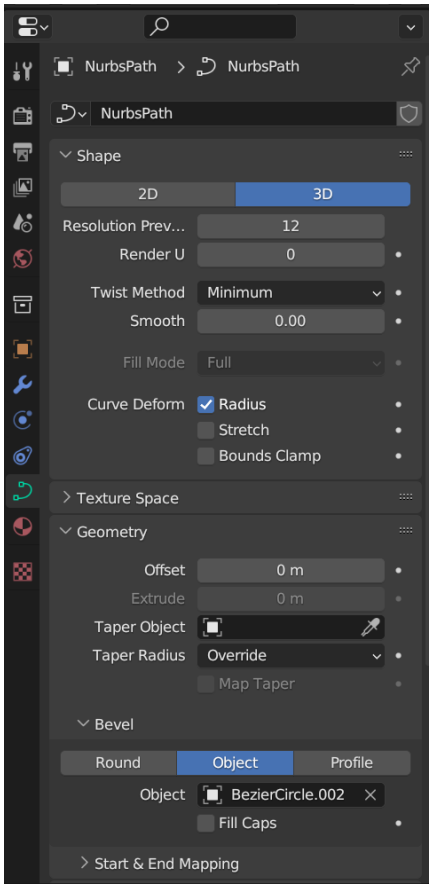

Figure 16 – Bezier curve shape (character.blend)

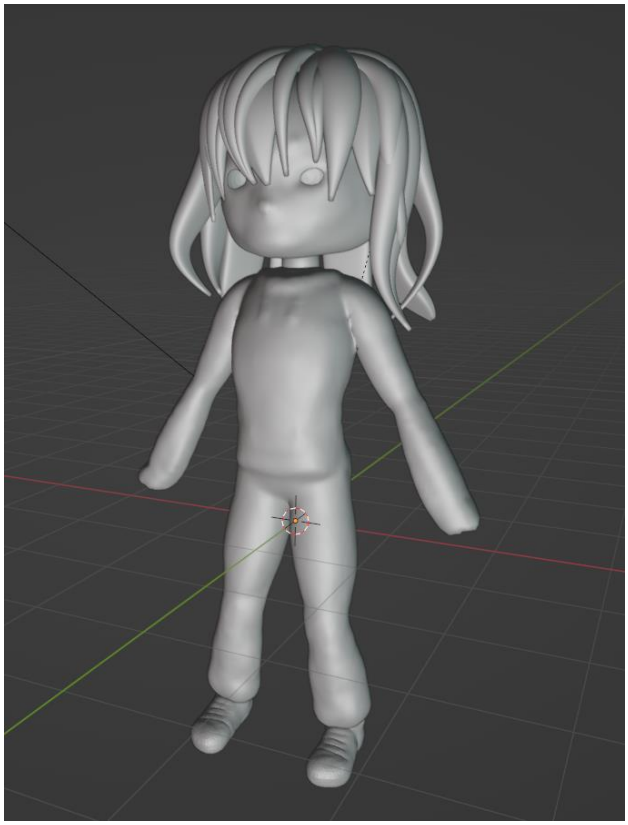

Figure 17 – Character Unrigged (character.blend)

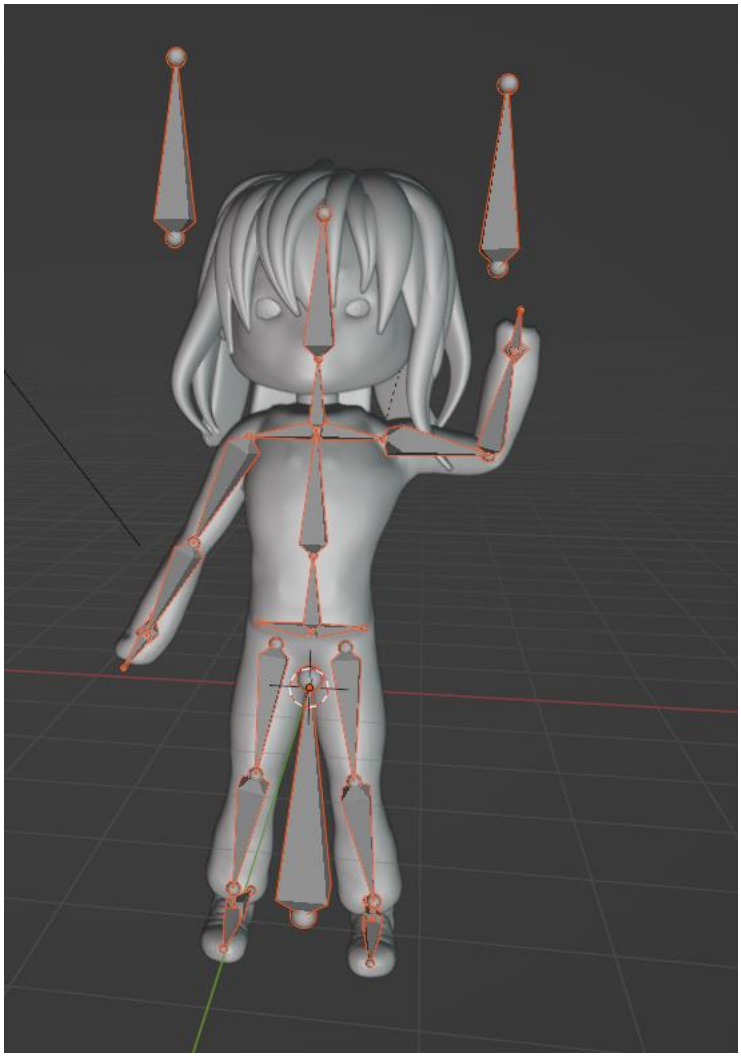

Figure 18 – Character Rig (character.blend)

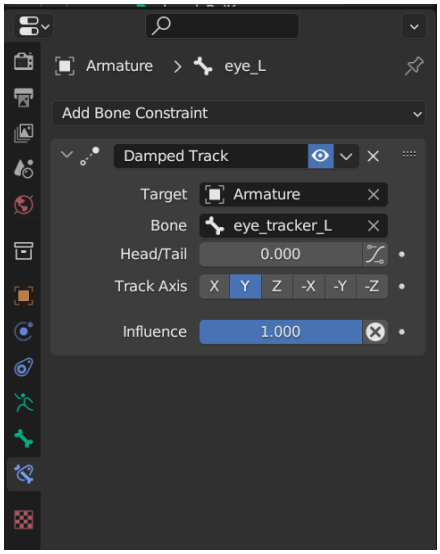

Figure 19 – Left Eye bone constraint

LLandinam and computer science buildings

The three main environments in this animation are the computer science building, a hallway, and the void. The void and the hallway are in the same file, since the void is filled with floating pieces of the hallway.

The computer science building was fairly easy to model, and consists of two main parts: the bricks and the windows. The bricks were modelled first, and then I used an array modifier to make them tall enough. Then I created the windows and used the array modifier to fill in the gaps. I also used the mirror modifier so that I only had to build half of the Llandinam tower. I did not use it for the computer science building as that one is not symmetrical. I did however use the bevel modifier to add some extra detail to all of the buildings.

The texture of the windows is just the built-in brick texture mixed with a gradient texture to create a nice cartoonish effect. I was inspired by the look of the windows in the Sonic Adventures game for this.

The road, pavement and grassy bank are all planes that were manipulated in various ways.

The plant boxes are just cubes that were extruded a couple of times.

The lamps are made up three parts- a cylinder which was extruded upwards, the head which is made of an elongated square with a subdivision surface modifier, and the bulbs which are flattened iko spheres. The bulbs have an emission shader on them to give them a glowy effect. Each lamp also has a spot light right underneath it to give it the circle light effect, and a point lamp for some diffuse lighting.

There is a lot of lighting going on in the computer science building scene, as I wanted a sunrise which meant I has to have a sun lamp and backlights that are all animated. My backlights are large area lamps.

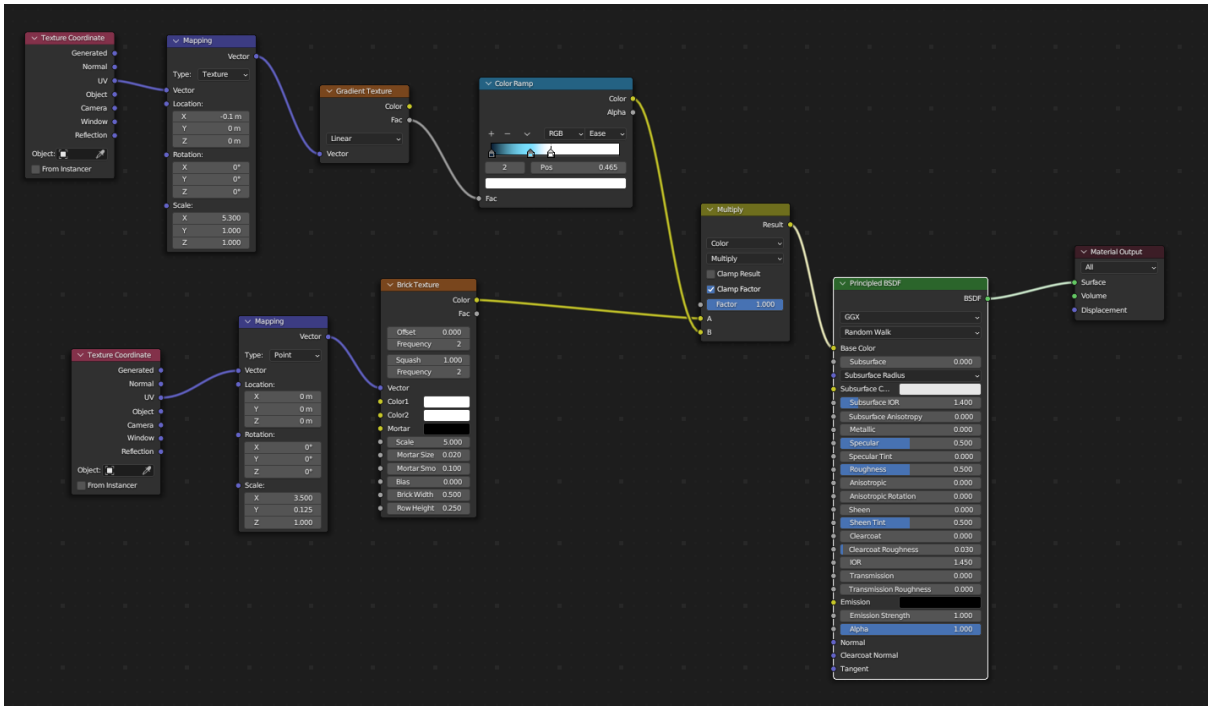

Figure 20 – Window material nodes (envo2.blend)

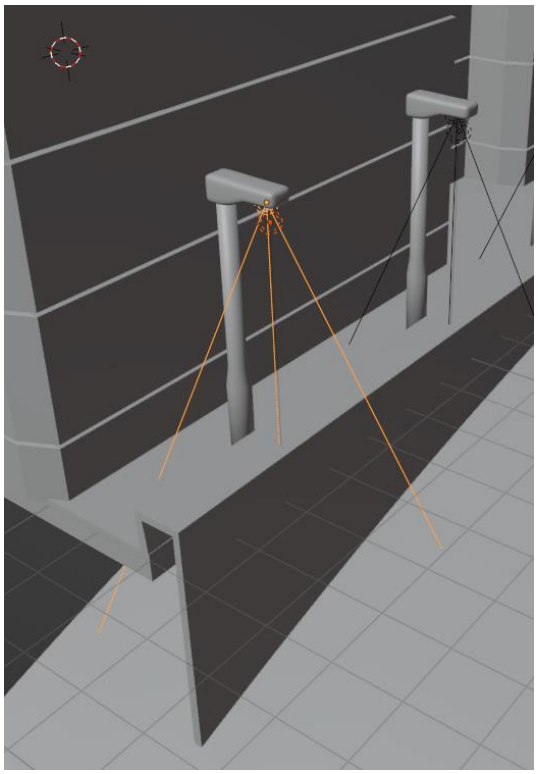

Figure 21 – Streetlight Object with spotlight and point lamp (envo2.blend)

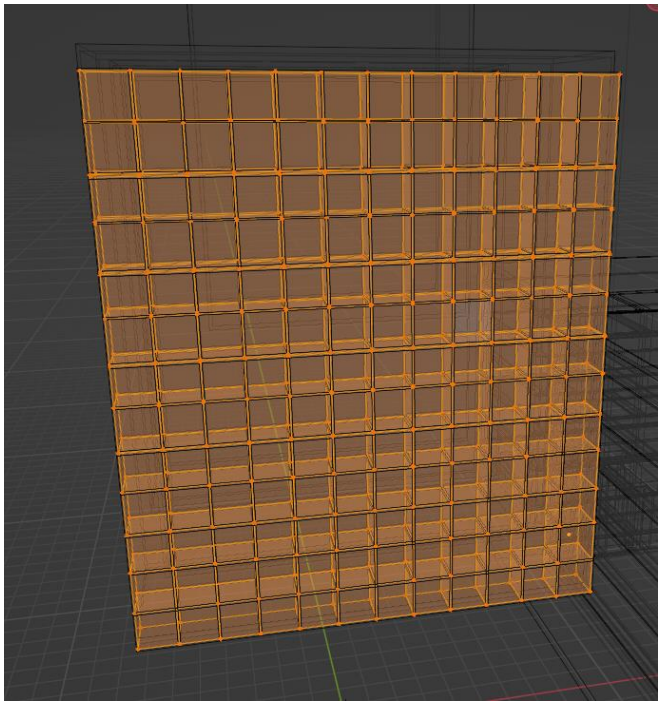

Figure 22 – Vertices of the Llandinam building made with array modifier (envo2.blend)

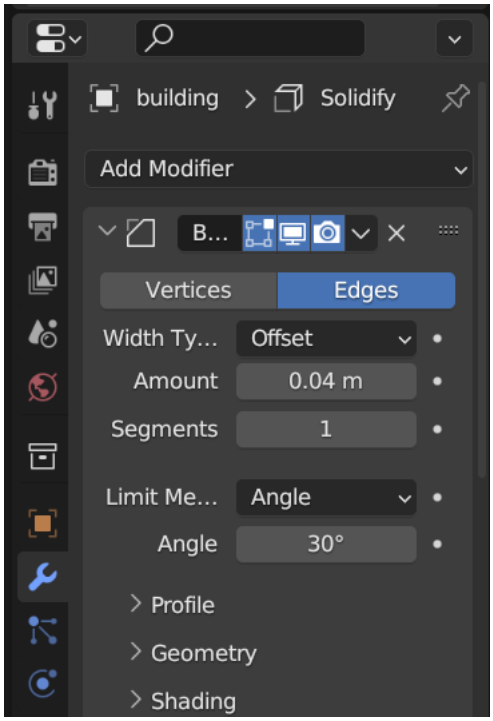

Figure 23 – Bevel modifier on compsci building (envo2.blend)

Hallway

The hallway was fairly simple to make, since it's repeating pattern, I created four wall pieces, a door, and a lamp (using the same technique as the streetlamp) and used an array modifier to repeat them fourteen times. In this scene I animated the focal length of the camera because I wanted to give a slight uncanny zoom affect, to put the audience in the character's shoes and make it feel like the hallway was getting closer and further away.

The void is also mostly made of the hallway with the cell fracture effect used on it to create lots of sharp pieces. I then created a simulation by turning the cells into rigid bodies and then separating them into their own meshes (p>separate by loose parts). I turned off gravity in the world settings and added a large cube that I used as a force field.

I also added another cube with a volumetrics affects to create some quick fog.

Finally, I made the background purple and added a sunlamp.

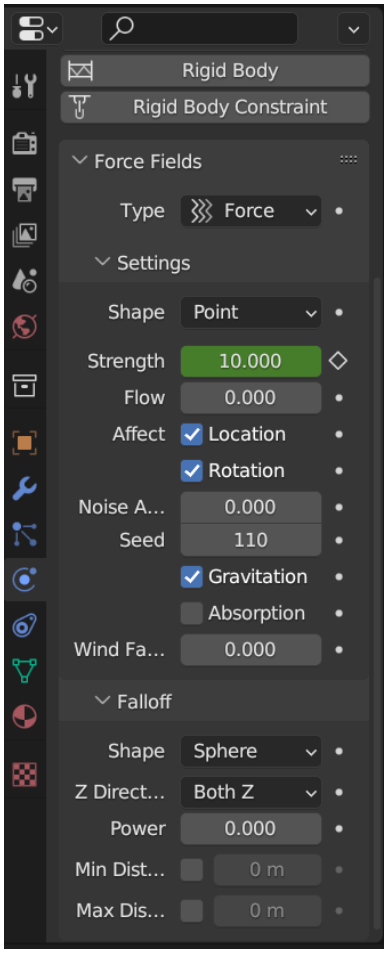

Figure 24 – Force field settings (hallway.blend)

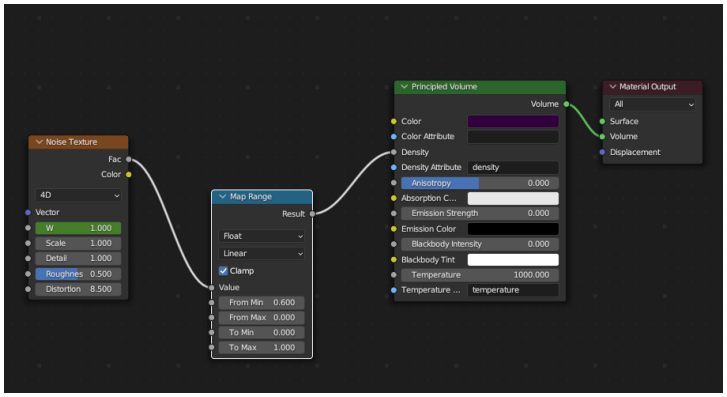

Figure 25 – Fog Material

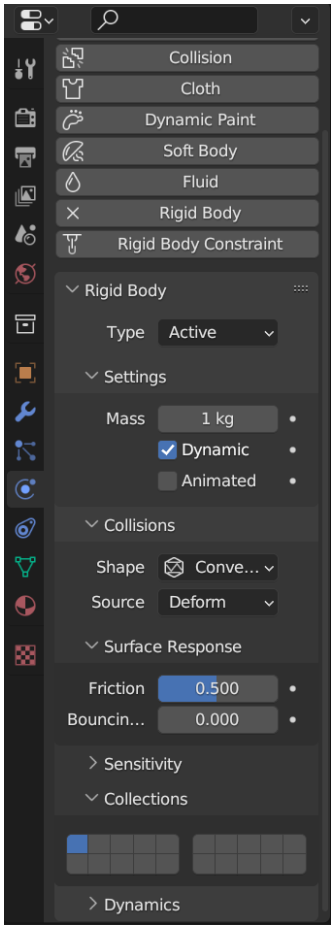

Figure 26 – Rigid body constraints (hallway.blend)

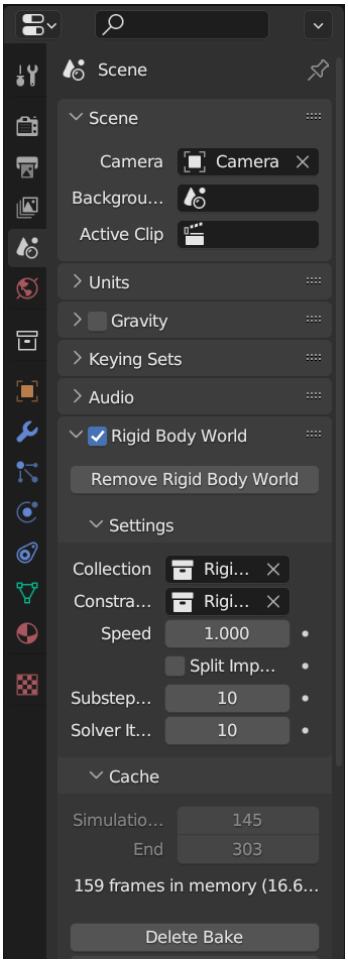

Figure 27 – World settings (hallway.blend)

Portal

The portal is made up of fairly simple shapes, with the photo I edited in Gimp earlier used as a texture.

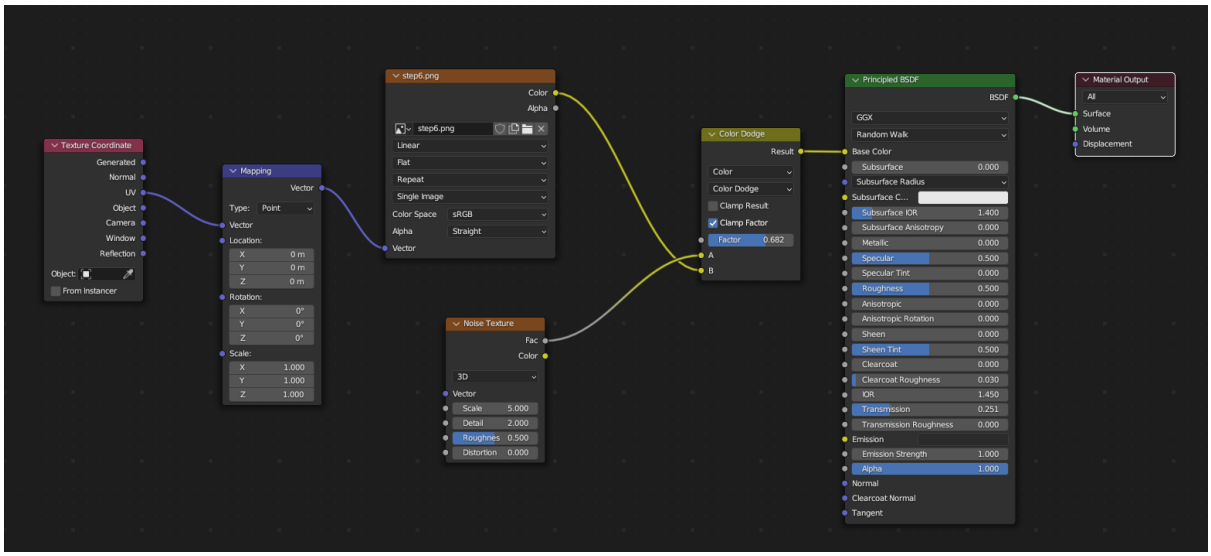

Figure 28 – image texture (portal.blend)

Text

Finally, the text at the beginning and end of my video were created using the blender built in text tool. I tried to add lineart to my text, but unfortunately the solidify modifier was not working properly. I realised that to be able to add lineart I would have to remesh all of the text by hand (I tried using the remesh modifier and it didn't work), however I did not have time to do this.

Figure 29 – What happens when you try to add lineart to text

Self-Evaluation

Video link: https://youtu.be/AIoGdPfK12Y

I worked very hard on this project to create something fun and at least semi-professional looking. I wanted to tell a story and I thought about every element (colour pallets, lighting, poses, camera placement) and how it contributed to the narrative.

GIMP: I feel I demonstrated my familiarity with photo editing software well. I used lots of Gimp effects, as well as layers and the draw tool. The only place where I really fell short was trying to use the photo I'd taken in my animation. I am hoping to get around the 80% mark for this.

Modelling: Modelling in blender is something that I love and have been learning since I was 11 years old. That being said, I am still not terribly good at sculpting and I need to continue to study the human form if I wish to create characters who don't fall in the uncanny valley area. I deliberately went for a more cartoony style as I thought it would make modelling the character easier. I do think my strength lies in inorganic objects such as buildings, as I am very proficient in using a wide array of modifiers to speed up the modelling process. I also enjoy modelling precise things, and find geometric shapes easier to visualise.

I am not terribly good at rigging as I usually rely quite heavily on the rigify add-on, so I don't have a lot of practice. Despite this I did my best, and made use of IK bones and bone constraints. Where my animation really shines is in the framing and lighting of my scenes. I used the framing and camera motion and even focal length to try and convey a sense of story progression and unease throughout the animation. One bit I am particularly proud of is when the character looks up at the Llandinam building- the shadow at their feet and the rising height of the camera helps to convey how overwhelmed they are despite the fact that there is not facial expression.

I do realise that to take the character model to the next level the mesh would need to be smoothed out and facial expressions in the form of shape keys or bones added. I had originally planned to draw a mouth using the grease pencil, until I read in the instructions that we were not supposed to use the grease pencil.

My character animations themselves were also not very smooth (particularly where the feet touched the ground), and this was both due to my poor rig design and the fact that I really struggle to animate people. To improve I would need to use reference videos to make the animation more realistic, and actually use the animation curves on the character instead of exclusively using them for the camera.

Although this was not required and was not in my final video, I did make a quick 2D storyboard to reference when making my animation. If I was doing this more professionally, there would have been more frames per second in the storyboard, and an indicator of what frame the animation was currently on.

I hope to get a really high mark for this section, as I was very pleased with the final video. Perhaps a 90%?

Video editing: I created essentially three layers for my video. A sound layer, a black layer and a video layer. The different video clips could have the fade in and out effects as needed and it would always fade to black because of the black layer underneath. I also managed to time the video to the audio

quite well, especially in the section where the character lands from their fall. I hope to get 70%-80% for this section.

Report: My written report was a little rushed, and as a computer scientist, explaining my thought process in plain English can sometimes be difficult. To improve I would need to get better at spelling and grammar, as well as figuring out how out explain all of my ideas in a concise way. Despite that I hope I've adequately explained what I've done in a meaningful way. I hope to get around 50% for this section.

References

[1]

'Villainous by David Fesliyan - Royalty Free Music Download'. https://www.fesliyanstudios.com/royalty-free-music/download/villainous/397 (accessed Aug. 11, 2023).

[2]

'*RWBY*', *Wikipedia*. Aug. 10, 2023. Accessed: Aug. 11, 2023. [Online]. Available: https://en.wikipedia.org/w/index.php?title=RWBY&oldid=1169702907

[3]

'(23) Simple Toon Shader in Blender [Eevee] - YouTube'. https://www.youtube.com/watch?v=qs4QUGKm6XU (accessed Aug. 11, 2023).

[4]

'*Drifting Home*', *Wikipedia*. Aug. 04, 2023. Accessed: Aug. 11, 2023. [Online]. Available: https://en.wikipedia.org/w/index.php?title=Drifting_Home&oldid=1168646482

[5]

'Vanellope von Schweetz | Wreck-It Ralph Wiki | Fandom'. https://wreckitralph.fandom.com/wiki/Vanellope_von_Schweetz (accessed Aug. 11, 2023).