

CS324 Graphics Coursework Report

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1 Instructions

To run the code, one must already have a local web server setup. Once the local web server is setup, the next step is just to run localhost and start running the html file. Live Server (Ritwick D.) [1] has been used for the development of this project.

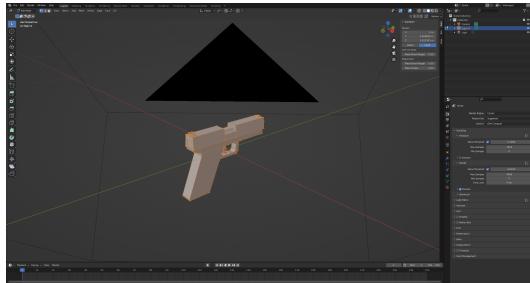
The instructions on how to play the game itself is written on the menu screen of the game, where one can navigate between the two levels before choosing to begin the game.

2 Totem Hunter - The Game

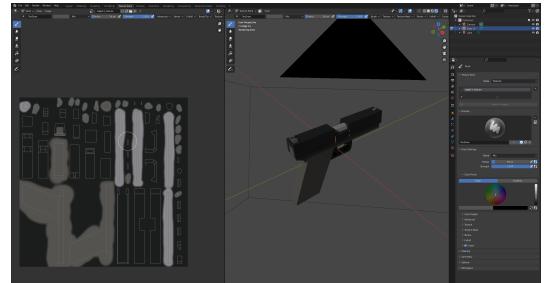
The game is a very simple first person shooter game, where the players will have to complete the objectives of lighting up all the totems to win the game. The more totems the player lights up, or the more enemies the players kill, the higher the score the player gets in the end. The score will also depreciate as time passes. Getting items may not be the best choice as the player needs to fight a battle of time when playing this game. It is best to consider strategies such as running through masses of enemies, risking damage just to light up a totem, or chain killing a lot of enemies when they are lined up. The following sections will talk about the engineering of the game and aspects used to make the game.

3 Blender

The game has no imported assets at all. All assets were made from scratch on blender. The most time was spent making the two main guns that the player can swap between: XenTech 99 and Edge 14. The XenTech 99 is a fast but inaccurate and low damaging rifle that allows for quick bursts, while the Edge 14 is a slow but accurate and high damaging pistol to finish enemies off. The Edge 14 was designed to be a slightly more common modern weapon, while

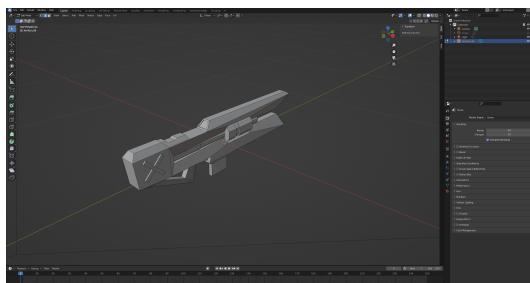


(a) Edit Mode Completed

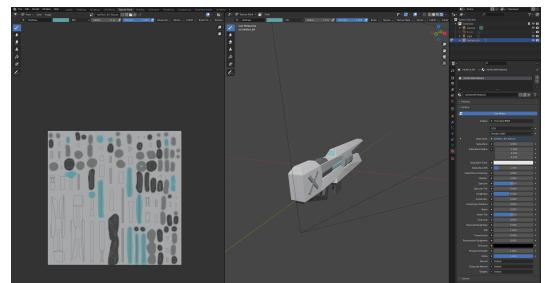


(b) UV Map and Paint Done

Figure 1: Edge 14



(a) Final Design



(b) Finished Version

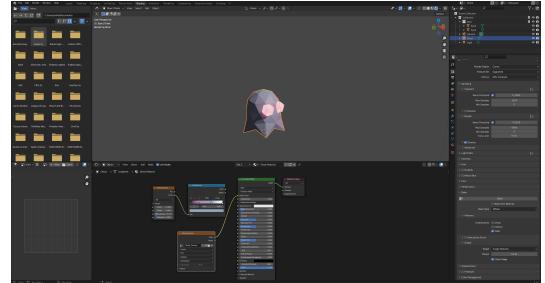
Figure 2: XenTech 99

the XenTech 99 was designed to be a more futuristic sci-fi weapon. This is to ensure a wider range of audiences are satisfied. The guns were made so that the players can have the freedom of choosing their desired firearm, with their own advantages and disadvantages.

Another more interesting model that was made for this game were the enemies. The ghosts in the game made use of Noise Texturing in blender, then fed into a Color Ramp to make the rainbow glittery colour, almost prismatic. But it also has a red glow in the eyes to make it look scary and intimidating as well. The textures were baked so that they can fit in the rendering while swapping out with other textures to make the red damaging effect. Meanwhile the rocky enemy is made to look like an unbreakable ball of spike, but this time was more handcrafted compared to the ghost.

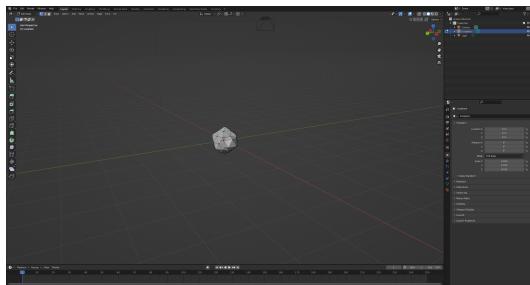


(a) Model Completed

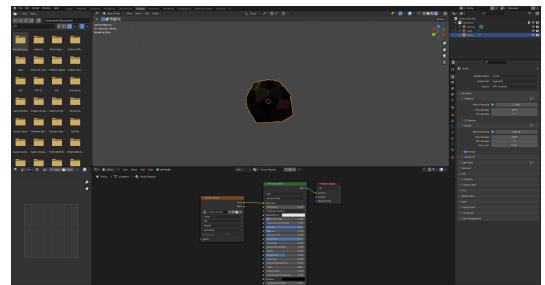


(b) Procedural Textures Baked

Figure 3: Ghost



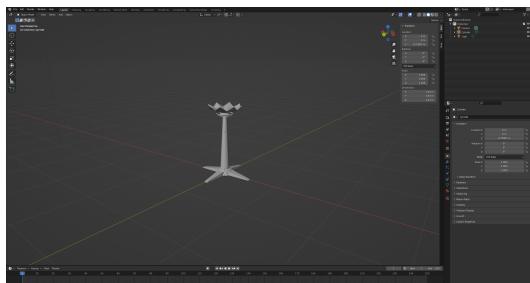
(a) Edit Done



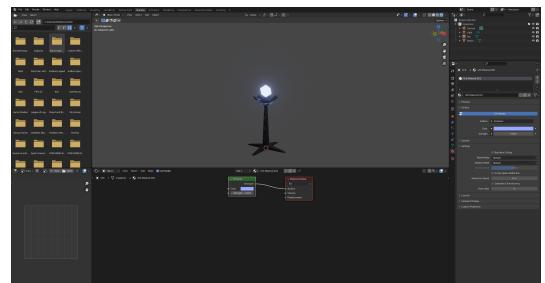
(b) Metallic Finish

Figure 4: Rocky

Finally, the totems had very complicated design. The model took a while to complete, while the texture had detailed runes drawn on it to make it look like the player has activated the totem. The crates that the players can get are also made so that they have a shining core as if there is a big reward inside of it.



(a) Final Design of Model

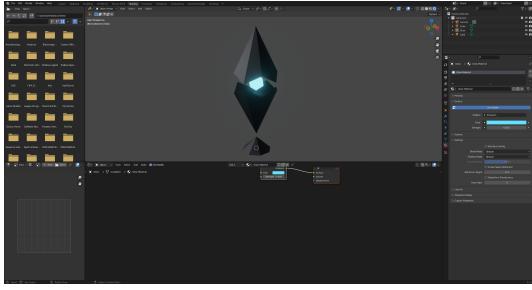


(b) Totem Completed with Orb

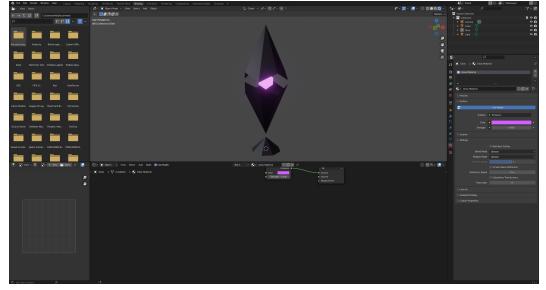
Figure 5: Totem

4 Levels

The coursework does include two distinct levels. Although the floor is procedurally generated, everything about the two levels are different. No matter the lighting, the color scheme, the amount of totems and enemies, the heightmap and smoothness, the difficulty, and even the fog is different. Level 1 was made for easier audiences as it is a more relaxing



(a) Normal Color



(b) Rare Color

Figure 6: Crate

and simple level, though the vibe is still eerie. The second level is much more difficult as the terrain is much harder, and the enemies are faster and tankier, and do more damage. The fog is much thicker so its harder to see anything too. The vibe of the second level is to make it more scary for the players as the color scheme is volcanic. Also there are randomly placed rocks made from blender all around the world as well, only exclusive to the second level!

5 Light Sources

The game ensured many light sources are made. For example, the objective of the game itself is to light up totems. When a totem is lit up, an orb will shine on the totem to stop the enemies from spawning, and the rings and the runes of the totem will shine as well. This is done with precise PointLights positioning. There are also light sources in crates that the players can get. The iso-sphere will spin faster when the players collect the crate and the light source will slowly fade away. The ambient and hemisphere light is made to ensure the vibe of the game is eerie and spooky, so the player can have an enjoyable experience.

6 Menu

The game has a functioning menu that allows the navigation between the two levels. It also displays instructions and victory / loss messages. It also has a score and displays item collection in game. Most importantly it has an HP bar showing health.

7 Camera

The game is a first person shooter game, so it naturally passes the camera requirement. The camera actually has a unique function: the ability to aim down sight on a weapon. When aiming down sight, the camera fov is changed, so it looks like the player is slowed down (also speed is reduced too). The XenTech 99 also has a scope, so there is a blue tinted effect when aiming on that weapon.

8 Extra

The game has its own physics engine implemented from scratch (didn't use the three js examples). The detection of flooring uses indices and triangles which is a really good way of implementation. The floor is generated procedurally from Perlin noise (which is cited in the code. (banksean 2022) [2]. Other extra stuff in the code as well.