

COSC 729 Firefighter Simulation

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Game Description- Fire Fighter Simulation

Once the game is started it will be controlled by the First Person-Controller and there will be fire added as triggers so once the player gets collided with the fire, the health of the player as well as the points of the player would be reduced. Therefore, the player has to avoid getting burnt by the fire and try to save as much people as possible from the burning building within a short period of time.

Upon getting close to the victim avatar (which simulates the saving of the avatar from the fire) the avatar would disappear which means the avatar was saved by the Player and the health of the Player as well as the points of the player would increase for saving the victim. The Player can be navigated using the arrow keys and the space bar is used for “Jump” action to avoid any fire triggers.

Goals and Objectives

- The goal of this project is to create a fire simulation fire drill. This simulation creates a sense of virtual reality presence for a young fire fighter.
- This simulation saves time and money as well as the environment as it can be accessed anywhere at any time.
- This application will be useful for the firefighters in training themselves and to gain confidence to face a real fire hazardous situation
- Playing this game would basically help especially firefighters that are new in to their career to build self-confidence and tap into their fire senses before they face a real hazardous event

Modelling

- **Planned geometry-** Unity was used to create and design the game. The terrain was customised modelled i.e. trees, grass and hills. Moreover, several buildings were added using the Asset Store in Unity and a Firetruck was added using a Sketchup model to the environment.
- **Use of Texture-** The virtual world uses great texture implementation. The grass is green and is animated (swaying in the wind). The world cast shadows and light using the sky map. The colors are appropriate for the objects.
- **Animation, Behavior and Functionality-** First person controller is used in playing the game so the game would be using the First Person-Controller camera to navigate through the environment. Textures were mainly used to create the grass as well as the mountains to give it a greenery view to the environment.

The fire truck that was taken from sketch up can be seen pulling up to the building. It has a looping animation to simulate it driving towards the fire.

The victim avatar can be seen running from the fire trying to escape the scene. The fire is animated and can be seen dancing as it burns

Functionality and Implementation

Vision

To make the environment more realistic, grass, mountains and trees were added. Also, several buildings were added to simulate a neighborhood.

Fire truck was added to simulate that the firefighters arrived to the building fire using the firetruck.

Fire was also added in several areas to simulate a fire hazard situation from an explosion.

The fire is used as triggers in the game.

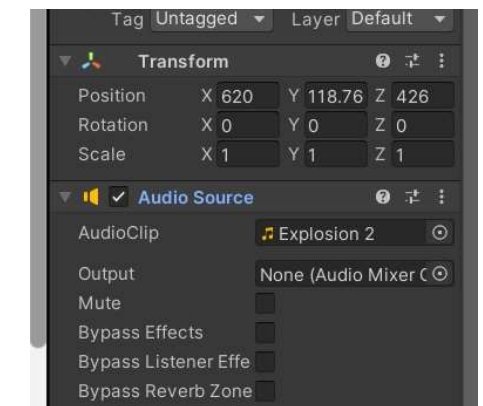


Functionality and Implementation

Sound

Ambient sound of the Player walking and Jumping has been added to the game.

Moreover, explosion sounds have also been added to simulate the fire hazard situation. Furthermore, people screaming sounds have been added to create a realistic hazardous environment.



Functionality and Implementation

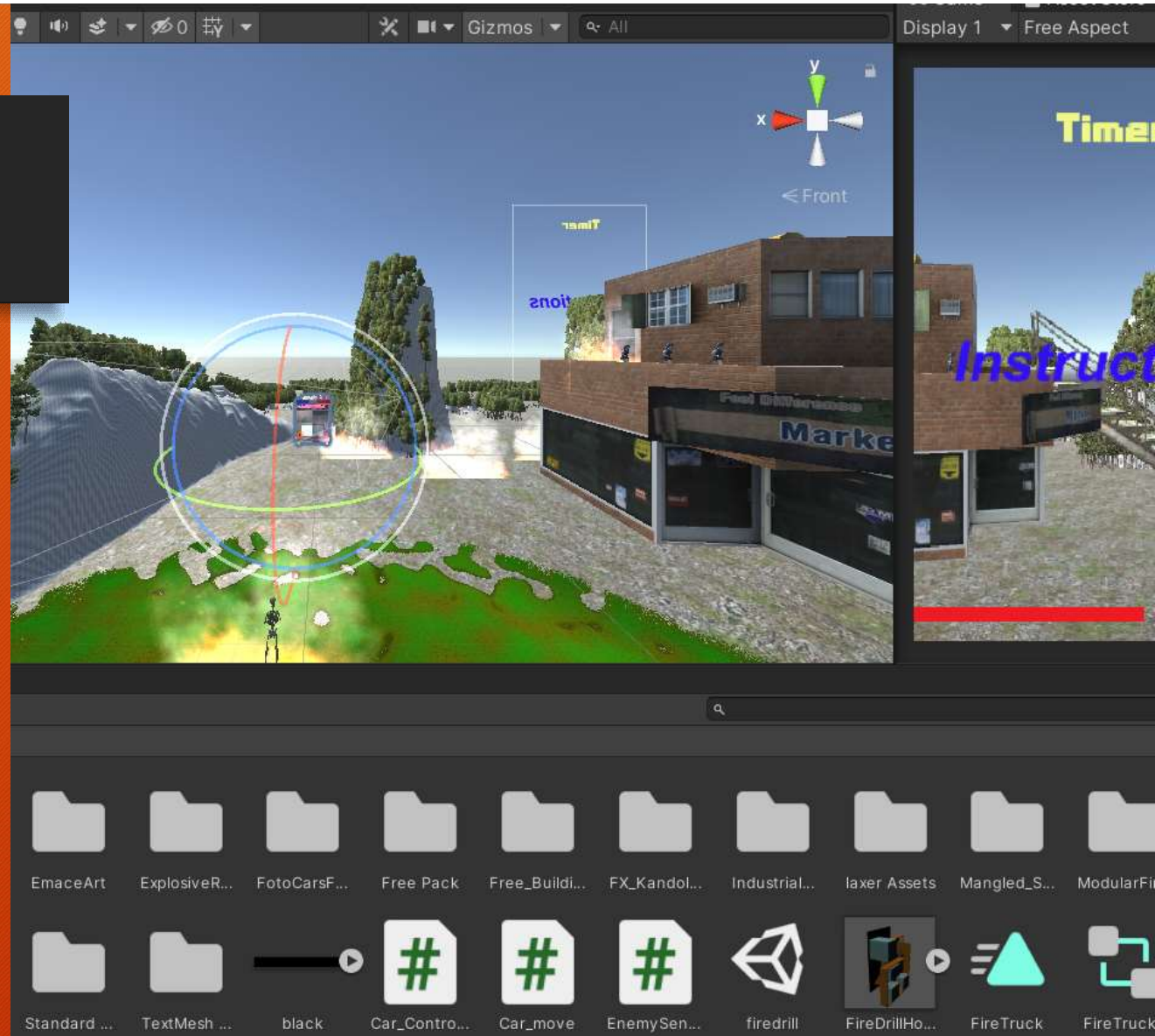
Animation

A looping animating was added to the sketch up fire truck to simulate the fire fighters arriving.

The fire has animations to simulate burning.

The victim avatar all have running animation to show that they are fearful and trying to escape.

The grass has animation to simulate them swaying in the wind.



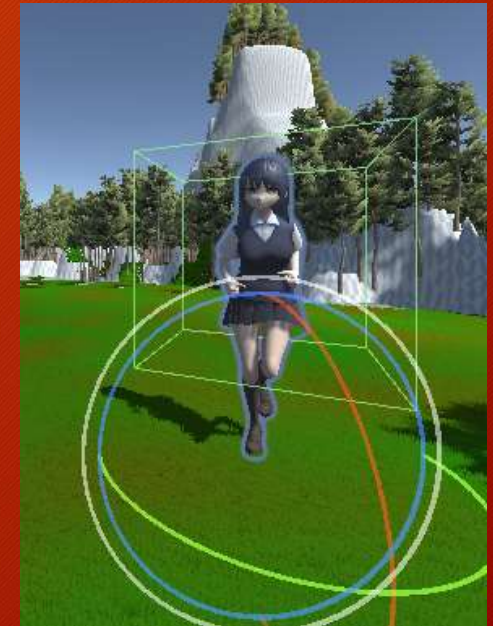
Functionality and Implementation

Interactivity

we have used the fire as a trigger in which if the Player goes very close to the fire the Player's health would reduce.

Another trigger used is the victim trigger. When the Player goes close to the avatar which is the victim, the avatar would disappear which simulates that the avatar was saved by the Player

Moreover, the health of the Player would increase at the same time whenever each victim is saved from the burning building.



Functionality and Implementation

Sensors

Time sensor: added to this game mainly so that the Player could save as many people as possible within a short period of time. Because this is a fire hazard event, time plays a major role, so the Player has to be fast in accomplishing his tasks.

Score Sensor: added so that the FPS player can see when they saved a civilian or being burnt by the fire. Score increases once a victim is saved and decreasing once they have entered into a blazing fire.

Health Sensor: added to show whether the FPS player is being harmed or not. Health increase when a civilian is saved and decrease when the FPS enters a fire.

Vitim Sensor: adds health and score to FPS player

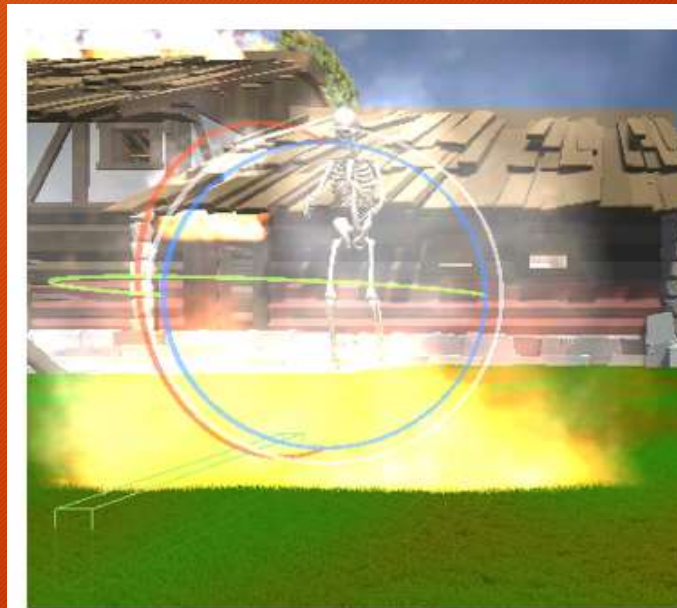
Enemy Sensor: decrease health and score for FPS player

Functionality and Implementation

Avatars

Two types of avatars within the simulation are Enemy avatars as well as Victim Avatars.

Enemy Avatars has an enemy sensor attached while Victim avatars has a Victim sensor



Enemy Avatar



Victim Avatar

Challenges Faced

- Since we used Unity in creating the game, it was difficult to find some of the models that were needed because most of the models in the asset store was not free and you had to pay for it.
- The other issue faced was, when exporting certain models from SketchUp, the quality of the 3D models was not good, so it impacted the entire game quality
- Because of the time constraints, we were unable to add more features and animations to the game. A proper game creation usually takes more than one month to be perfected in designing. With the given time constraint, we were unable to add more interactive functionalities to the game.
- Since we are new to these 3D modelling software we had to work extra hard to learn some of the software functionalities by watching videos and reading external contents which took most of our time and energy
- Since the class was done virtually, we were not able to use the VR lab and there were some difficulties faced in using some of the 3D software since our computers were getting slower due to the installations done.

Future Improvements

- Due to the time constraints, we were unable to add a functionality in adding a task list and once the firefighter finishes up a task a check mark would appear on the side of the task list and his points would increase. This would definitely be added in future improvements
- More levels to the can be added. Once the Player finishes one level the next level will be unlocked. That way, the Player would not lose interest in the game because different scenarios would be added to each level
- We wanted to add different level because we have the knowledge of creating and generating new scenes using the Scene Management library but time did not allow for that.
- Furthermore, if the game could be upgraded to the augmented reality version the Player would have a feeling of actually being in the hazardous environment and it would make the simulation of the fire hazard more realistic and exciting

Thank You!

