Assignment 3: First Person Shooter game!

Mahdi Davoodikakhki, Ali Mahdavi Amiri

November 4, 2019

Deadline : November 28, 2019

1 OVERVIEW

You are to implement a simple first person shooter game for Oculus Go virtual reality headset. You are given a project, which has a player character that can shoot, reload the gun and move around the environment.

When submitting to Canvas, please zip everything you have (codes, report) into one single file "yourname-studentnumber-ass3.zip".

2 SETTING UP OCULUS GO AND UNITY

There is a nice tutorial for installing the Unity and setting up both of the Unity engine and Oculus go for developing and building the game in here. Please note that you need to install the latest Unity version in order to open the project, so you can ignore the unity version mentioned in the tutorial. Moreover, newer versions of Unity let you build and run the app on your headset. So, you don't need to use the "adb" commands yourself.

3 Game
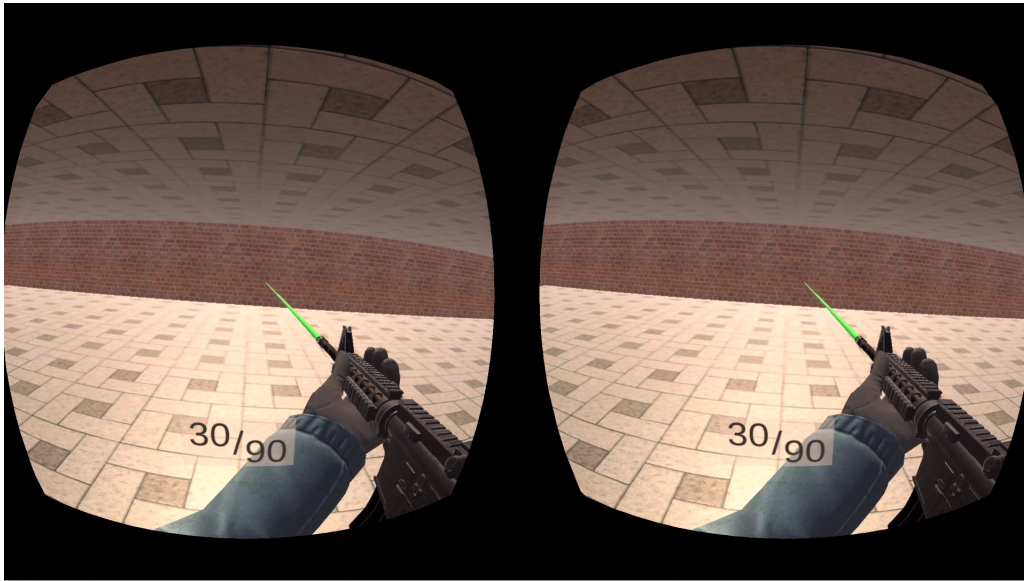
The player character moves based on the position of the finger on the handset touch-pad. It shoots the gun by pressing the trigger and reloads the magazine with the handset back button. You can rotate the character by rotating your head.

There are some missing parts from the player codes, which we will complete them in the class. The missing parts are completing the reload animation, putting bullet holes on wall, instantiating the muzzle flash, and shoot sound when firing the gun. You will lose points if these missing parts are not implemented in your final output.

All of the player and the enemy actions should be implemented with animations.

(a) Creating the basic enemy character [3 Marks]

In this part, you are asked to implement the enemy character, which walks in a predefined path in the game world. Each character should have the ability to have a different path from the other enemies. The target positions are passed as an array to the enemy controller script. Note that when the enemy character reaches the last target, it should go back to the first target and start its path again from the first target point.

Enemy characters should have a red uniform instead of blue ones. You should make a new material and use the texture provided as "Soldier_Body_diffuse_red.png" in "shooter pack/swat.fbm" folder.

(b) Detecting the player [3 Marks]

While the enemy walks in the path, it can detect the player character. This happens when the player moves into the enemy field of view. When the enemy detects the player, it should run towards the player until it reaches the distance of 10 meters from it. The enemy should also maintain the distance when the player moves farther from the enemy.

(c) Shooting to the player [3 Marks]

When the enemy detects the player and reaches the distance of 10 meters to the player character, it starts shooting at the player. The enemy gun shooting should be implemented with Physics ray cast. The enemy can shoot at most 5 bullets per second. You should also randomize the shooting vector, so that 20% of the times enemy bullets hit the player. When the player health becomes zero or less, you should run the death animation and move the camera to a fixed position.

(d) Player shooting and health [3 Marks]

For this part, you should complete the player's scripts. The player can shoot and kill the enemies, and also lose health when the enemy shoots him. You should also add the player's health to the UI Canvas in the project. When player kills the enemy, you should add Physics Rigidbody and collider to gun and make it an independent object from the dead enemy. Moreover, the enemy will detect the player when the player shoots him.

(e) Creating the environment [3 Marks]

The game environment should have multiple rooms and enemies. Each enemy should have a unique set of path targets. You should make an escape door in the last room. When the player reaches that position, it will win the game. The escape door should be implemented with a trigger collider.

Also, When the game finishes, whether by escaping the last room or player getting killed, the game should restart after 10 seconds.

(f) Ammo supply [1 Bonus Mark]

Create ammo crates, which the player can refill its ammunition by reaching it.

(g) Enemies getting cover [1 Bonus Mark]

When the enemy detects the player, instead of running towards the player, it goes to the nearest cover. The enemy should sit behind the cover and shoot the player in turn.

(h) Detecting body part hits [1 Bonus Mark]

Instead of reducing the health by 20% by each shot, each part has its own importance. Hitting the head would kill the either player or enemy. Hitting hands, chest and legs will reduce the health by 10, 30 and 20 percent respectively.

(i) Swapping guns [2 Bonus Marks]

By clicking the touch-pad the player will swap the primary weapon with another weapon, by clicking again it will swap the secondary weapon with the primary one. For this part, there are no animations provided, so you should create or find the required animations yourself.