VR Zombie Shooter Documentation

Intelligent Virtual Environments course at ETSIINF UPM

Game Instructions

Welcome to VR Zombie Shooter. In this virtual reality game, your objective is to kill approaching zombies by shooting them with your virtual gun. The game does not currently contain menu or settings. The only thing you need to do is to install the .apk file on your Android smartphone and run the game. After the game is launched, the zombies automatically spawn and start moving towards the player. Game is meant to be played indefinitely, until you decide to stop and close the application. Here is how to play:

Movement: Since this is a VR game, use the VR headset like Google Cardboard to look around environment.

Shooting: Aim your gun at the approaching zombie head and wait for a split second. The game will fire automatically for you. For easier aiming, the gun has laser sight attached.

Note: The bullet takes a little bit of time to travel from the gun to the zombie. When firing at a long distance, you must aim where the zombies are yet to be.

Game Elements and Description

Game Environment

- The game takes place in a confined space surrounded by walls.

- The floor is textured with a zombie-themed environment to enhance the immersive experience.

- Crates are scattered around the scene, providing cover and obstacles.

- Background music to set the tone and enhance the immersion even more.

Zombies

- Zombies are the enemies in the game.

- Zombies move towards the player (main camera) using a built-in pathfinding system.

- Shooting a zombie in the head is the only way to kill him.

Gun

- The player's weapon is a virtual gun attached to the main camera.

- The gun has an automatic shooting mechanism that uses raycasting feature with a cooldown period to prevent rapid firing.

Project Structure

Main Game Scene

- The primary scene where the gameplay occurs.

- Includes the player's VR camera, gun, zombies, and environment.

Assets

1. Game Assets:

- Folder containing textures, models, sounds and materials used for the game environment.

2. Resources:

- Folder containing prefabs used for instantiating zombies and bullets dynamically during gameplay.

3. Scripts:

- Folder containing player and zombie scripts.

4. GoogleVR:

- Folder containing Google VR SDK for Unity.

Game Objects and Components

1. Main Camera:

- Represents the player's perspective in VR.

2. Gun:

- Represents the virtual gun attached to the main camera.

3. Zombie:

- Represents the zombie enemy.

4. Spawn Point:

- Represents the point from which bullets are spawned.

- Positioned at the gun's muzzle.

Interaction and Game Mechanics

Player Script

This script is attached to a player character and handles shooting logic.

1. **Variables:**
    - **private GameObject gun**: Reference to the player's gun object.
    - **private GameObject spawnPoint**: Reference to the point where bullets will spawn.
    - **private bool isShooting**: Boolean to control shooting to avoid continuous shooting.
2. **Start Method:**
    - Sets the frame rate to 60, specifically for iOS.
    - Initializes **gun** and **spawnPoint** by getting references to child objects.
    - Sets **isShooting** to **false**.
3. **Shoot Coroutine:**
    - Coroutine function, allowing for delays.
    - Instantiates a bullet from a prefab named "Bullet."
    - Sets the bullet's position and rotation to the spawn point.
    - Adds force to the bullet in the direction of the spawn point's forward vector.
    - Plays gunshot sound and gun animation.
    - Destroys the bullet after 1 second.
    - Waits for 1 second before setting **isShooting** to **false**.
4. **Update Method:**
    - Casts a ray from **spawnPoint** in the direction of its forward vector.
    - If the ray hits an object with a name containing "Zombie" and is not already shooting, starts the shooting coroutine.

Zombie Script

This script is attached to a zombie character and handles its behavior.

1. **Variables:**
    - **private Transform goal**: Transform of the goal (where the zombie moves).
    - **private NavMeshAgent agent**: Reference to the NavMeshAgent for zombie movement.
2. **Start Method:**
    - Initializes **goal** as the main camera's transform.

- Initializes **agent** as the NavMeshAgent.
- Sets the agent's destination to the main camera's position.
- Starts the walking animation.

3. **OnTriggerEnter Method:**
    - Triggered when the zombie collides with something.
    - Disables the zombie's collider to prevent multiple collisions.
    - Destroys the bullet that collided with the zombie.
    - Stops the zombie from moving by setting its destination to its current position.
    - Stops the walking animation and plays a falling back animation.
    - Plays an audio clip (death sound).
    - Destroys the zombie after 6 seconds.
    - Instantiates a new zombie and repositions it to a random location more than 3 units away from the camera.

These scripts work together to create a simple shooting game where the player shoots zombies, and when a zombie is shot, it falls back, plays a death animation, and a new zombie is instantiated at a random location.

Pathfinding

Utilizes Unity's NavMesh system to enable zombies to navigate the game environment intelligently.