Computer Graphics Final Project

By Tyler Hoerschgen and Tarek Elbendary

Requirements

* Hands which interact with the world physically.
* Ability to pick up and drop objects.
* At least a couple of interactions between the different items you can pick up.

Description

This is a virtual reality(VR) basketball shooter game created by Tyler Hoerschgen and Tarek Elbendary. In the game, the player attempts to score the most points they can within the 60 seconds they’re given.

Issues/Solutions

* The first issue we ran into was getting the VR tracking to actually work. We decided to use VRTK for handling our VR camera and controllers because it works with different devices and it has good documentation. We were able to get the camera and controller tracking working by following video tutorials from [Ryan Murray](https://www.youtube.com/playlist?list=PLZTzR-SmgYcN0hogMHsT82AO8hJreGe7o) and VRTK’s own [guides](https://academy.vrtk.io/Documentation/HowToGuides/).
* The next issue we had was getting the button presses to call a method. We remedied this problem by adding the script as a component to the “MinimumReached” GameObject. We then added the script and it’s subsequent method call to the “Boolean Action” script’s Activated List.
* Another issue we have involves VRTK’s handling of intractable objects, such as the basketball. We rarely get an error about accessing null objects but this error hasn’t occurred enough to test if the problem has actually been fixed.

Scripts/Classes

Timer

The timer script controls the timer of the game. It starts from 60 seconds once the first ball is spawned. During the 60 seconds, this script only updates the remaining time text. Once the 60 seconds are up, the timer script stops the timer, resets the clock to 60 seconds, moves the hoop back to its original position if it’s set to move, and updates the high score if applicable. If the high score was updated, a congratulatory sound will be played. Otherwise, a hopeful yet defeated sound will be played.

spawnBall

The spawnBall script is used to spawn and despawn balls. When the left button is pressed, a ball will “shoot” out of a cannon towards the player. In addition,a sound effect for the button press and the cannon shot will play. The newly spawned interactable ball will be added to a GameObject List so that we can despawn it later. When five balls are active within the scene and another ball is spawned, the oldest spawned ball will despawn. This is unless the player is currently holding the oldest ball, in which case, the second oldest will despawn instead so that no more than five balls are ever available. When the game ends, as designated by the Timer script, all active balls will despawn, unless the player is currently holding one. However, this ball will not give points to the player if it’s shot into the hoop.

MoveHoop

The MoveHoop script is responsible for controlling whether the hoop should move or not. When the player presses the right button, the hoop moves left to right, increasing the difficulty. This also increases the point reward from one to two, making this high a high risk and high reward. When the right button is pressed again, the hoop will return to its default position and cease its movement. The hoop will also be moved back to its static default position when the game ends.

hoopControl

The HoopControl script is responsible for incrementing the player’s score, handling the explosion effect and sound, and destroying the ball. A cube with a box collider is placed within the rim and is used to determine when a ball collides with it. Upon collision, the ball is despawned, the explosion is initiated, and the score is updated.

Audio

The Audio script handles all of the audio. All of the other scripts must call Audio’s method to initiate any sound effects. That’s pretty much all it does. Just audio.

Custom Animations

The custom animation script was the work of [Josp101 and DMTSource](https://assetstore.unity.com/packages/3d/characters/humanoids/humans/audience-crowd-8563#reviews). I merely added it to the crowd game object. Essentially, it will randomly select an animation to play for each of the members of the crowd.

Secret

The secret script was added towards the end of the project as an easter egg. It is nearly identical to the hoopControl script but it will award three points for making a basket into the opposite side’s hoop and play a different video effect.

Video

[VR Basketball Demo](https://youtu.be/g64hAX3auDk)