Basketball in Unity: A Concept for VR

Project idea by: Aryeh Ness

The idea of this project was to create a simple, interactive game of basketball that could be incorporated with the motion controls of the Hydra. To accomplish this, I first built the court and hoops. Then, using a first person controller with a mouse, I coded in the shot taking and scoring for both the home and away sides. The hardest part about this was coding in a 2 or 3 point shot-to do this, I had to custom draw my own 3 point line onto the court and use the distance from that to the hoop to decide how to score a successful shot. Following this, I added a basket underneath the scoring net to prevent shots going in from underneath as counting. I then added out of bounds detection for the ball, and using the right click as an option to teleport the ball back to the player. When all of this was functioning properly, I added the rest of the surrounding area-the stands, the different colors for the out of bounds of the court, the ceiling and surrounding arena area. Then I made a workable pause menu that gives the option for the player to return to the main menu, resume the game as was or reload the scene as it started. I added as part of this a timer in the top right corner of the screen that upon finishing, would reload the player to the main menu. I then added scoring areas to both the home and away hoops, and displayed that score in the top left of the screen. From here, I fine-tuned a few things: I added the ability for the player to walk into the ball to pick it up, the strength of the shot varying with how long the mouse was clicked for, and a set jump height for the player. Once all of this was done, I brought the project into the lab to convert from the First Person Controller to using the Hydra. The switch was relatively easy, minus the collision detection for the player walking into the ball-that took some time to figure out. I coded in that the player would throw the ball by “throwing” with the controller, and depending on the strength of that throw, the ball would fly farther. This was done by taking the position of the controller at two seperate times, and if the controller had moved a minimum amount, the ball would be thrown. This part of the project doesn’t always perform as intended-the throwing isn’t as consistent as I’d like, as the ball will sometimes not throw for the same motion it just threw for.

This combined many elements from the lab-the design from Lab 1, the main menu and waterball game from Lab 3, and the landscaping from lab 5.

To run this project, all that is needed is Unity and a Hydra. There is nothing else required.

The controls for the game are as follows:

**Hydra**:

Move - Left Joystick

Jump - Left Trigger

Rotate Camera - Right Joystick

Respawn Ball in Hand - Right Trigger

Pause - P

**Mouse:**

Move - WASD / arrow keys

Jump - Spacebar

Rotate Camera - Mouse

Respawn Ball in hand - Right Click

Pause - P