Game Design Document:

Racquetball

By:

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**High Concept:**

**Elevator Pitch:**

A semi-realistic racquetball arcade game with powerups, upgradeable racquets, and an AI opponent to play against. This game is perfect for people who love racquetball or those who want to enjoy a fun arcade game.

**Game Type:**

This is an arcade style game that will be developed for a desktop but could ideally work on a mobile device or a platform console too. This game is intended for those between ages 12 – 30. Like many arcade games, this will be one of skill that will take practice to achieve proficiency. Also, like similar games in its category, this game will consist of a bunch of a smaller game sessions where when the player wins or loses the round, they will immediately be able to try again next round. These fast-paced resets are what will make the game fun and addictive. The game could be playable with one or two players. This game will take quite a bit of skill as movement and hitting the ball take some getting used to.

**Differentiators:**

This game will be different than other arcade style games because I am going to ~~try to~~ make the game mechanics as realistic as possible to real life racquetball (except for the powerups). So, while this game will still have the fun arcade aspect, I want it to still be very similar to racquetball. On the other hand, this game will be different than racquetball mainly with the fun powerups that I am going to implement in the game.

**Features:**

* Close to real world physics
* AI opponent

**Unique Selling Points:**

* There’s not a ton of fun sports games. They’re usually either very realistic, or very fake and “arcadey”. My game aims to bridge the gap between these two styles of games.
* This game is different in the terms of most sports games. A lot of people make soccer or basketball sports games. It’s not very common at all to find a racquetball game (let alone a fun one).
* Realistic aspect. I wanted to make this game realistic enough that the player could take the concepts from the video game and apply them to a real life racquetball game. This is mainly in regard to the physics and where the ball goes in certain situations and how the player can expect the ball to behave in real life. I am hoping to replicate the way the ball moves in real life inside the game.

**Game Play:**

**Introduction:**

This is the game of racquetball. This game has a simple story. The name of the character is one given by the user. This character has only one life goal: to play racquetball. Along the player’s journey, they’ll battle their opponent in order to collect coins and upgrade their racquets. The player gets to choose the difficulty of their opponent. A higher difficulty means more coins will be awarded at the end of the game.

**In Game Competition:**

**AI Opponent:**

The AI opponent isn’t the smartest, but it’s a worthy opponent nonetheless. The AI has all of the same advantages as the player. The opponent’s constant mission is to get to the ball before it can hit the ground twice and then to hit the ball against the wall when it gets close enough. The AI will always aim the ball in a random spot on the upper half of the front wall.

**Game Mechanics**

**Player Controls:**

The game character movement will be controlled by traditional WASD keys or the arrow keys. The player will hit the ball automatically by walking close enough to it. To aim your shot, simply move your mouse in the direction you’d like the ball to go. The player can jump by pressing the space bar.

**Physics:**

The game attempts to model real world physics as close as possible.

example, in real life, if I hit the racquetball at a specific spot on the back wall with a specific speed, I would expect to see the ball come off the wall at a specific speed, trajectory, and with a specific bounce. This game tries for the equivalent in-game hit to have the exact same speed, trajectory, and bounce. This way I can keep my vision of having this game be a tool for real life racquetball players.

(Never Got Implemented)

**Gear Selection:**

**Gear Viewer:**

The player will be able to view all player owned racquets as well as ones not purchased yet. The racquets will each have a unique display name, look, and stats. The player’s racquet will affect things like max power, swing radius, and swing error.

**Purchase Screen:**

When viewing the racquets, there will be an option to purchase them if the player has enough coins.

**Game Content:**

**Characters:**

The characters are made up of capsule shapes. The player controlled character is red and the AI opponent is green.

(Abandoned Idea)

**Racquets:**

~~Racquets can all be the same 3D asset but with different colors denoting the different racquets and ranks. The concept of racquets may end up just being replaced by an upgraded hitting radius.~~

(Never Got Implemented)

**Sounds and Effects:**

The game will have a few songs that loop during play and while in the menu screens. I plan to have various sound effects like sounds when the racquet hits the ball and when the ball hits the wall. I will also have a sound play at the beginning and end of every round.

**Setting:**

The entirety of the game is played in the same setting. The game is played in a rectangular racquetball court. I originally had the court the same dimensions as an actual racquetball court, but I eventually made the court smaller to make the game more fun and increase playability.

**Timeline:**

October 18th: I hope to have the game scene created and the court more or less finished.

Completed

October 25th: I would like to have all of the physics for the ball implemented

Almost Completed (minor issues)

November 8th: I would like to have the player movement & ball hitting functionality finished

Almost Completed (minor issues)

November 22nd: I would like to have the AI implemented with all the difficulties

Partially Completed

Not Completed

~~November 29~~~~th~~~~: I would like to have all the sounds and effects done in the game~~

~~December 2~~~~nd~~~~: I need to have the gear selection and upgrade functionality done by this date~~

I gave myself about a week for each step. I gave myself two weeks for the player and AI opponent implementations since I believe those will be the more challenging parts that take longer.

**Mid Report Update:**

The progress on the assignment has been going somewhat smoothly. I easily got the game scene setup and the court created. I’ve had a few hiccups with the movement, but overall, it seems to be working fine. Right now, my biggest struggle is finding a good way to hit the ball where I want it to go. This part is only working halfway correctly. My other main issue is that when the player is going fast enough, it goes through the collider on the court wall and the player falls through space. I do not know how the player is able to go through the collider.

**Post Project Thoughts & Reflections:**

Overall, I’m not overly thrilled with how this project turned out, but I am content with it. After the mid point, I wasn’t very optimistic about the state of my game. However, in the end, it turned up being more playable than I thought it would be.

I had to change several implementations and ideas throughout the development process. For example, I originally made the game to have POV cameras for the players. After playing the game with the POV camera, I decided to switch to a third person view because I thought it made the game more playable. I also had to change my movement implementation from moving the transform to using physics and moving the rigidbody.

Another thing that took a lot of tweaking was the player’s ball detection collider and how the player hit the ball when it was within the collider. These are things that I didn’t plan on being so finnicky and I pictured them going much smoother in my head.

Ultimately, the game isn’t great, but it doesn’t completely suck. I think I could definitely make the game much better if I were given more time to work on and improve it. I learned a couple of new concepts and had some enjoyment while making this game so I’d consider it a win.

**“Debriefing”**

* Single player mouse and keyboard racquetball game
* WASD movement and mouse to aim
* Static 3rd person POV camera
* Simple AI to play against
* Overall gameplay works and most game rules are implemented correctly
* Game keeps player score and displays on screen
* Bug exists where player or ball goes too fast and goes through walls sometimes
* Inspector view shows player and AI hitting raycasts