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70% Completion Specification

Integrate Arduino and Unity

Firstly, integration between the Unity and Arduino sides of the project must be made. This connection will allow the Unity Engine to retrieve data from the Arduino, and therein create a way for the end user to receive active responses from the simulation, i.e: a feedback loop. Ultimately, the goal of this application is to become a viable teaching tool for tightrope walking. Therefore, having such data is important for the application to process it with its own code and being able to output any advice the user should be given to help them succeed in learning this skill. Therefore, this output must be visually shown to the user through a user interface.

Refining Oculus Controls

More refined Oculus controls will be implemented in order to both interact with the motion of the player object and the graphical user interface icons. This means increasing the walk speed in the simulation so that walking in real life can move the player farther than they would be in the real world or transporting the player to different locations in order to leave the natural speed of the user in tact.

Graphical User Interface Completion

A graphical user interface will be created to show the consumer their current progress along the tightrope during a simulation as well as any advice or guidance when on the verge of failure or in need of course correction. The application will determine significant changes in the pressure data being retrieved from the foot pressure sensors. It then would processes the changes, i.e. “delta” to see if they fit the guidelines for the proper footing position for tight rope walking. If the way they are crossing the tightrope converges to proper form under this guideline, then the simulation would elicit a congratulatory response so that the user understands that they are on the correct path towards success. This will add psychological encouragement and motivation to continue across the entirety of the rope. If the user doesn’t have the correct footing position, then the simulation will note the difference between the user’s footing and the accepted footing for tightrope walking and output a response or alert to explain what they are doing wrong and how they can improve themselves. Other user interface features would include a foot pressure mapping icon that indicates which points on the feet the user is putting pressure on, which will give them a better idea of how they need to change their footing position.

Improved Title Screen

As mentioned previously, there will be a title screen for the user to interact with upon launching the tightroping simulation. This will consist of a difficulty selection, allowing the user to select which stage of difficulty they would like to begin with in case they are more experienced and would like to bypass the more trivial simulations. This way they can better challenge themselves with the more psychologically taxing simulation situations, in which he or she is tightroping at a much higher altitude around structures that naturally are much higher from the ground.

Difficulty Stages

To expand on the difficulty stages, at least three stages have been planned for users to practice on. The easiest difficulty level has the user begin in a backyard where the user is very close of the ground and must tightrope walk between two wooden stumps. The second difficulty level would have the user tightroping in between two skyscrapers looking over a city. The third difficulty level would have the user tightrope walking between two mountains in a more natural and treacherous looking setting. It is highly imperative to make these scenes aesthetically pleasing in a realistic sense, so that the user feels like they are really in those types of situations. A more realistic feel with better looking three-dimensional models and assets would make the psychological effects of acrophobia (fear of heights) more taxing on the user, which in turn would make them more apt to handle similar or less intense situations in the real world.