

# Individual Work Contribution

## *Unity-Based Fighter*

### *“Dance of Warriors”*

#### **1** *Brayden Tremper*

##### *1.1 Bio*

I am in my final year at Oregon State University for a degree in Computer Science with an applied option in Game and Simulation programming. I have had previous experience in Unity3D and C# through the Video Game Development Club, personal projects, and an internship. With this, I have completed game development projects for 2D, 3D, and VR environments.

##### *1.2 Description of work contribution*

The main contributions I have made for the project involve the music analysis, enemy AI, input tracking, third-person camera, a dynamic reticle, character ragdolls, health system, general movement animations, UI and graphics within the game, and allowing stored player preferences. The music analysis created allows for a selected song, given its beats per minute, to be broken down further into its respective keynotes, 1 through 4, which can be tracked allowing for an action to take place at the desired keynote. This has been applied to the game environment allowing for lights to be intensified at given keynotes in sync with the song's beat as well as enemy actions where the enemy has the ability to select an action at a given keynote based on their location in respect to the player. Building on this enemy the AI is set up in sync with the music analysis allowing it to calculate a path, and select an action, some examples being to attack the player, block incoming attacks when the player is not on beat, dash to reach the player, and more. Following this, I have set up the input tracking for both mouse and keyboard as well as gamepad controller support where each input is binded to a selected button, mouse, or thumbstick allowing each to return a value or function, depending on the case, to then be used to control the player's actions. In addition to this, I set up the third-person camera, using Unity's cinemachine package, allowing it to follow the player where it can be rotated when given a user input which in turn rotates the player so the back is always directed towards the camera. Building on this camera system I implemented an aim functionality that adjusts the field of view for the camera as well as a dynamic reticle which changes size based on this zoom as well as player movement.

I also created the character health system which can be applied to both the player and enemies which tracks the character's current health along with the health of each specific limb, allows them to take damage, heal when desired, and implements a death method that turns the character into a lifeless

ragdoll. Building on the ragdoll, this is set up allowing the character model to function as a humanoid while also applying colliders on each of the character's limbs where limb damage is implemented allowing damaged limbs to exhibit a negative effect which will be implemented soon. Finally, I set up the graphics within the game for the character's models along with the map environment with this I also set up all the major UI in the game such as the main menu, player HUD, in-game menu screens, and more. With this in mind, I have also set up a way to store player preferences for the game such as the sound and look sensitivity within the game which are stored for continued use. These highlight the main contributions I have made for the project thus far but I have also spent time assisting with bugs that other teammates have encountered and aiding in management for the project. In the future development of the project I am seeking to work on making the enemy move and transition between states more smoothly and expanding on the enemies available actions which can be triggered on beat with the music for situations when the enemy is patrolling around the map, following the player, and in the attack range of the player.