

For our Project 2, we built upon our downhill skiing simulator that we made in Project 1. Rather than using the keyboard to control the skier, the game now uses the IMU sensor to more accurately mimic the real motion required to ski. On top of using the IMU for lateral movement, a second dimension of motion was added to allow the user to mimic the effects of drag to change their downwards speed. We also incorporated a finite state machine to control the flow of conditionals along with increased visual feedback that shows the most efficient trajectory to reach the gates.

To accomplish this, we utilize the angular acceleration output from the IMU. Angular acceleration in the x-direction is used to measure the rotation of the upper body of the user parallel to the screen. This is meant to mimic the way that a skier changes their heading when going down the slope. The angular acceleration in the z-direction is used to measure the rotation of the user's body perpendicular to the screen. This is meant to simulate how leaning down and reducing your surface area increases the downhill velocity, and vice versa.

For our feedback, we worked to add in a visual that displays the ideal path the player should follow. This is shown by a shape on the ground that increases in size the farther the player gets away from the gates, as well as changing from red to green once the skier is on the correct side of the gate. We also added in more numerical data displaying to the screen to help the user better understand the effects that their physical movements have on the motion of the skier in the simulation.