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6.111 Final Project Abstract

Our project aims to implement an orientation based game controller/computer mouse. This device is able to read and integrate the data coming from the IMU over I2C and output standard USB interface codes. The device would effectively function as a drop in replacement for any computer mouse in any modern computer system. As a stretch goal we would implement added functionality in the way of buttons and an ergonomic housing. Games require extremely low latency commands and as such this is a great application for an FPGA. Our code would consist of a signal processing module (which filters the raw IMU signals), an integrator module (combines the accelerometer, gyro, and magnetometer into a cleaner output), an interpreter module (converts the user inputs into reasonable commands e.g. mouse up), and a transmit module (sends the signals to the computer over USB). A further stretch goal would be to add a wireless interface between the controller and the PC (probably bluetooth).

The final product should be designed in such a way that the user is able to easily adjust the sensitivity and responsiveness of the controller.