

Group 9, involving Jacob Bonilla and Gian Fajardo (me)

For our project, I wanted to suggest that we learn how to read sensor data from an MPU6050 and the QMC5883L. The MPU6050 is a gyroscope/accelerometer in one package, and the QMC5883L is a magnetometer/digital compass. For this simple objective, we will try to retrieve this data directly from the two sensors and onto the i2c bus, and in particular we will try to use interrupts generated from the MPU6050. For the demonstration, one idea we can try is to use the servo to output the body-frame orientation from each sensor. If time permits, and if online resources are permitted, we can also try to access the additional MPU6050 resources like the digital low-pass filter (DLPF) and the Digital Motion Processor all dumped into the onboard FIFO. (The DLPF might be more feasible but the FIFO might be fine too **if** I can crib off of the extensive amount of work done by [Jeff Rowberg](#) and co. on the issue).

For a full disclosure: I have had one set of these sensors from a previous project in trying to make an orientation estimator known as the Madgwick Filter. Jacob and I will not try to recreate this filter (my C++ code relied on the FIFO extensively). The main hurdle that is relevant for this class was that I never learned how to access the registers of my microcontroller to access the I2C data from any sensor. That is the main thing that we should focus on.