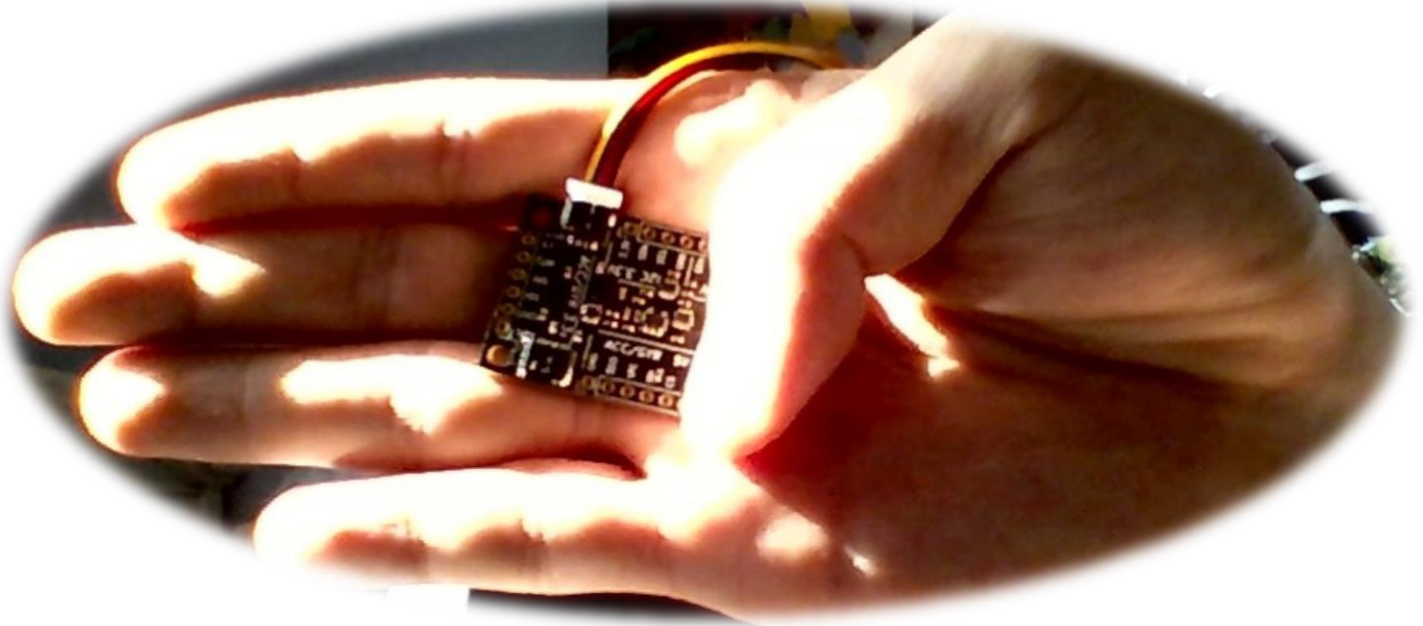Justin Suh Week 6 Report

Plan:

- Continue to explore the IMU to create a better gesture recognition system
- Meet up with teammates to talk about the communication between the IMU and MP3 player
- Continue to work with the IMU for different gestures
- I will be creating a table of possible hand gestures with descriptions on what they are and try asking people what is most intuitive.

Did:

- The hand motion for next song is currently set to be a clockwise hand horizontal tilt away from the body and back to initial hand location with the IMU on the palm of your hand with the wires facing up when your palm is facing up.

- The hand motion for previous song is currently set to be a counterclockwise hand horizontal tilt toward the body and back to initial hand location
- To recognize the two gestures above, I first got the raw readings from GYRx and then stored the past value as pastGYRx and got the difference of those (pastGYRx - GYRx) called diffGYRx.
- From experimentation, a decent threshold value for diffGYRx was around $\pm$800-1100 (+ for next song, - for previous song) but I am currently using a value of $\pm$1000
- However, with just these threshold values the readings were extremely noisy and read to play next song when it was not intended to.
  - Therefore, after passing the first test of the diffGYRx, a time.sleep was called. The time.sleep was set to 0.1 after a few experimentations.
  - Then I read for another raw Gyro reading called GYRxTemp to check for the returning to initial position motion
  - GYRxTemp is then subtracted from GYRx. We are expecting GYRxTemp to be a negative number and to not have the same amount of rapid change therefore, after a few tests, the difference threshold was set to be -1000 for next song and -1500 for previous song
- Finally, after the conditions above are passed, I printed out "Next Song" and set command to a preset value for each command.
- Then I call another time.sleep to prevent any rereads of the command. The time.sleep value will be continued to be tested to find what value is enough to prevent a reread. The current value is set to 1.1.
- Also, before every iteration, the command is checked to see if command is set to 0 and if not set it to 0.

Command	Command #
Play	1
Stop	2
Next Song	3
Previous Song	4

*There may be more commands added as we progress through this project

- There are still some issues with noise when operating the gesture recognition, but it is fairly good.

Future:

- Think about how get rid of more noise in the gesture recognition system
- Get the play and stop commands on the same level as the next and previous song
- Create a table for the possible hand gestures for play and stop. The next and previous commands are intuitive after asking a few people so we will be going with the current gestures for those.