Laboratory #05 ENEE 148A Fall 2016

In this lab you will work in pairs. You must divide up the code work and each of you indicate which routines you wrote or co-wrote. Complete the following tasks:

1. Build a circuit that uses the A/D converter to read the 3 analog outputs from the MMA7361 Accelerometer.
2. Write a code that will be used to calibrate the accelerometer so that the acceleration output is in g (1g = 9.81 m/s^2)
3. Write a code that:
   1. Will read and print out the 3 accelerometer values every 1 second for 100 seconds, along with the magnitude of the acceleration.
   2. Will integrate your data to produce velocity estimates for your accelerometer.
   3. Will integrate your velocity data to give location estimates for your device.
   4. Will print the current position and velocity of the device.
4. Run your codes, take your data, and print results for each axis (i.e. x-axis acceleration, velocity, and position.)
5. Have your instructor verify successful operation.

For the write-up of this lab, due 21 October 2016, you need to submit (1) a paper copy of the codes that you wrote and (2) an electronic copy of the codes that you wrote. You also need to draw a diagram of the circuit that you built. Write a summary document of your lab procedure and results of your codes (present and evaluate your results).

For more about the MMA7361, see here:

<http://eecs.oregonstate.edu/education/docs/accelerometer/MMA7361_module.pdf>

or

<http://www.apexelectrix.com/PDFs/MMA7361/MMA7361_module_datasheet.pdf>

Demo of its use with a Raspberry Pi:

<https://www.youtube.com/watch?v=t1f-DDpYdMY>