In this document, we include a list of things that we would have liked to add given more time. These would be potential tasks for future senior design teams.  
  
GUI:  
A GUI can always be improved. Specific features that could be added would be:

* using python toolboxes to add a plot of collected data prior to the student saving the file
* Alternatively, using python to plot data in real time as it is being recorded
* Improve GUI usability in general
* The python GUI could be packaged into an executable file for use with lab computers

Hardware:

The physical device can likely also be improved, leading to lower cost and better performance:

* Optimize PCB for smaller size (decreases per unit cost)
* Add more header pins to PCB, potentially allowing for future development of “breakout board” style PCBs
* Using a more powerful microcontroller will increase the sampling rate
* Allowing for a signal output could potentially be implemented for a Controls Lab experiment
* Adding ability for students to pass signals from the PCB to a breadboard circuit could be interesting, and could potentially find a use in upper level Communications and Signal Processing classes
* Changing the components used could likely decrease per unit cost
* Changing which potentiometers and amplifiers are used in which filters could likely decrease overall complexity of the circuit, which could make it easier to bring the size down

The physical device operation could be improved in several ways:

* Current Bandpass filters are not operating over the entire ranges of the potentiometers. This could be fixed with larger DC offset resistors/potentiometers
* One of the capacitors in the 6th order BPF needs to be changed back to 91nF
* In general filter ranges could be better optimized by changing capacitor values
* Expand the device for other courses

Firmware still needs:

* For digital sensors, only I2C sensors are working. More needs to be done for SPI sensors