Week 7 homework

Due date is Friday of week 9 at the start of class: that's the first week of classes after spring break.

At the start of class, please be ready to show Shubhang and me that you've completed the tasks of this assignment.

Status of your project, as I imagine it to be by the end of class, week 9

I want you to be at this point in your projects by the end of week 9's class:

- Group 1, piano: all four PCBs can record audio, and you have recorded the notes C4 – C5 (C4 is middle C) and C7 – C8 (the highest octave on the standard piano keyboard) using the PCBs. You have automated the process of documenting the sampling frequency used in each file by including its value in your Adafruit audio files and reading it in your python analyses. You have a clearly described, and well understood algorithm for identifying peaks in the Fourier spectra of each file. Your python code is able to handle a large number of files, extracting the information about peaks and sound intensities of the first several overtones from all the notes and all the files. You are beginning to assemble your project report.
- Group 2, LED vs. incandescent lamps: you are nearly finished with your project, having recorded spectra of various LED and incandescent bulbs powered (when a bulb can be dimmed) at different voltages. You have fits to blackbody spectra and graphs of relative intensities of different wavelengths, and ratios of visible to near IR power You are beginning to assemble your project report.
- Group 3, drone navigation: you have integrated data collection from a GPS, two DPS310s, a BME680, and an LSM9DS1 into your DAQ. You are able to integrate the accelerometer information to produce a position and altitude estimate. You can also interpret the DPS310 data to determine changes in altitude. You have studied the limitations to the integration technique due to accelerometer drifts and offsets, as well as to the DPS310 altitude determinations. You have measured how the navigation error grows with time duration of a flight, and with the drone's in-flight acceleration profile. You are beginning to assemble your project report.
- Group 4, bus vibrations: you are nearly finished with your project and have developed a sensible (and well understood) algorithm for identifying frequency peaks in the Fourier spectrum of accelerations. You have developed clear and informative ways of displaying your data, including as appropriate geographical information. You are beginning to assemble your project report.
- Group 6, paper production: you are nearly finished with your project and have long-duration recordings of temperature, pressure, humidity, and atmospheric VOC content during the paper-drying phase of paper production. You have compared these environmental variables for eight different locations in the drying setup as functions of time. You have made audio recordings of various kinds of paper that you've shaken, and have developed (as best as is possible) descriptions of the differences in acoustic signatures of the papers. You are beginning to assemble your project report.

Assignment:

All groups: all items from the bullet, above, corresponding to your group except for the "starting to assemble your report" activity. Show Shubhang and me that you have completed all these tasks.

