MAS.S66
Problem Set 5
Due 10.15

This problem set is intended to help you test the feasibility of your design. The main technical limitations of most projects are: cost, size, and power. You will analyze these for your product. Please bring your deliverables to class on the due date.

1. Determine the main power source for your project. Will it be battery powered? If so, how often will it be reasonable to expect the user to recharge it? If/when the user recharges it, will it have its own dock or get plugged into a standard connector? If a standard connector is used, will this be a wallwart, or into a USB port?

2. What are the main components of your design? Please include all subsystems, including any inputs or outputs, any processing, or any communication links (RF, USB, etc). If there is a processing subsystem, make a determination of what level of processor is required. This will be based upon the complexity of tasks you require. Simple tasks like responding to UI requests and changing output states would require a low level processor (e.g. 8b AVR), passing a lot of data and doing lots of multiplies would require a medium level processor (e.g. 32b ARM), or running complicated maching learning applications would require a high level processor (e.g. Raspberry Pi). For each subsystem find an IC, sensor, or other electrical component that would be able to complete the task. List the part(s) required, how much power they draw, how much they cost, and how much PCB realestate they take up (size). For complicated subsystems, using a prefabricated module might be the cheapest route.

3. For each subsystem calculate the percentage of time that it will be active, what the max current draw is, and what the average current draw is. Total these numbers up, and calculate what size battery or power supply would be required, and how often it would need to be recharged.

4. From the above information, determine if your design goals for size, cost and power are achievable. If not, decide where to modify your design - either in reducing functionality or by selecting different components, and justify this decision.