We propose a system for determining the location of various IoT devices and being able to remotely access them.

0.1 Stage 0

Early Deadline: End of this next week
Expected Deadline: End of the quarter
Late Deadline: First weekend of summer break

- Develop an algorithm to determine the position of IoT devices given distance from various reference nodes. This should include robust error handling
- Determine the physical mechanism that ascertains the device's distance from these reference nodes (i.e. communication protocol and hardware used)
- Determine the method by which the user can access the IoT devices, specifically how the user locates the device IoT device
- Determine the specification of the central hub hardware that contains the reference nodes if one needs to exist

0.2 Stage 1

Early Deadline: Week 0 of Fall 2018 quarter
Expected Deadline: Before fall design review
Late Deadline: End of winter break

- Write the program that determines IoT device position using algorithm determined in Stage 0. The input to the program at this stage is simply generated test data
- Using the hardware and protocol determined in Stage 0, write program (and configure hardware) to acquire the device's distance from a reference node. Data should be verified against hand measurements.
- Design and assemble the central hub hardware if one needs to exist
- Design a test UI to interact with a basic IoT device

0.3 Stage 2

Early Deadline: Before fall design review
Expected Deadline: End of winter break
Late Deadline: Before winter design review

- Determine a trivially simple IoT device to use for the test
- Integrate the components developed in Stage 1 into one system
- Test using the UI to turn on/off the IoT device selected. If central hub is used, the test should pass even in the presence of obstacles between the device and the hub.

0.4 Stage 3

Early Deadline: End of fall quarter
Expected Deadline: End of winter break
Late Deadline: Before winter design review

- Determine the interface a hardware vendor must provide to the system to utilize the device's functionality
- Determine how a UI is to be generated from information on IoT device
- Ensure that the existing protocol supports an arbitrary number of IoT devices. Tweak algorithms if necessary

0.5 Stage 4

Early Deadline: End of winter break
Expected Deadline: Before winter design review
Late Deadline: N/A

- Write the UI generator. The input is simply descriptions of fictitious IoT devices.
- Develop the current system so that IoT device information and capabilities are sent to the user
- Test the current on-off system on multiple trivially simple devices

0.6 Stage 5

Early Deadline: Before winter design review
Expected Deadline: N/A
Late Deadline: N/A

- Develop a few simple IoT setups with limited functionality. Write the hardware specification for these. (i.e. three LEDs and a choice to turn on one of them)
- Integrate the system with the UI generator.
- Test the setup