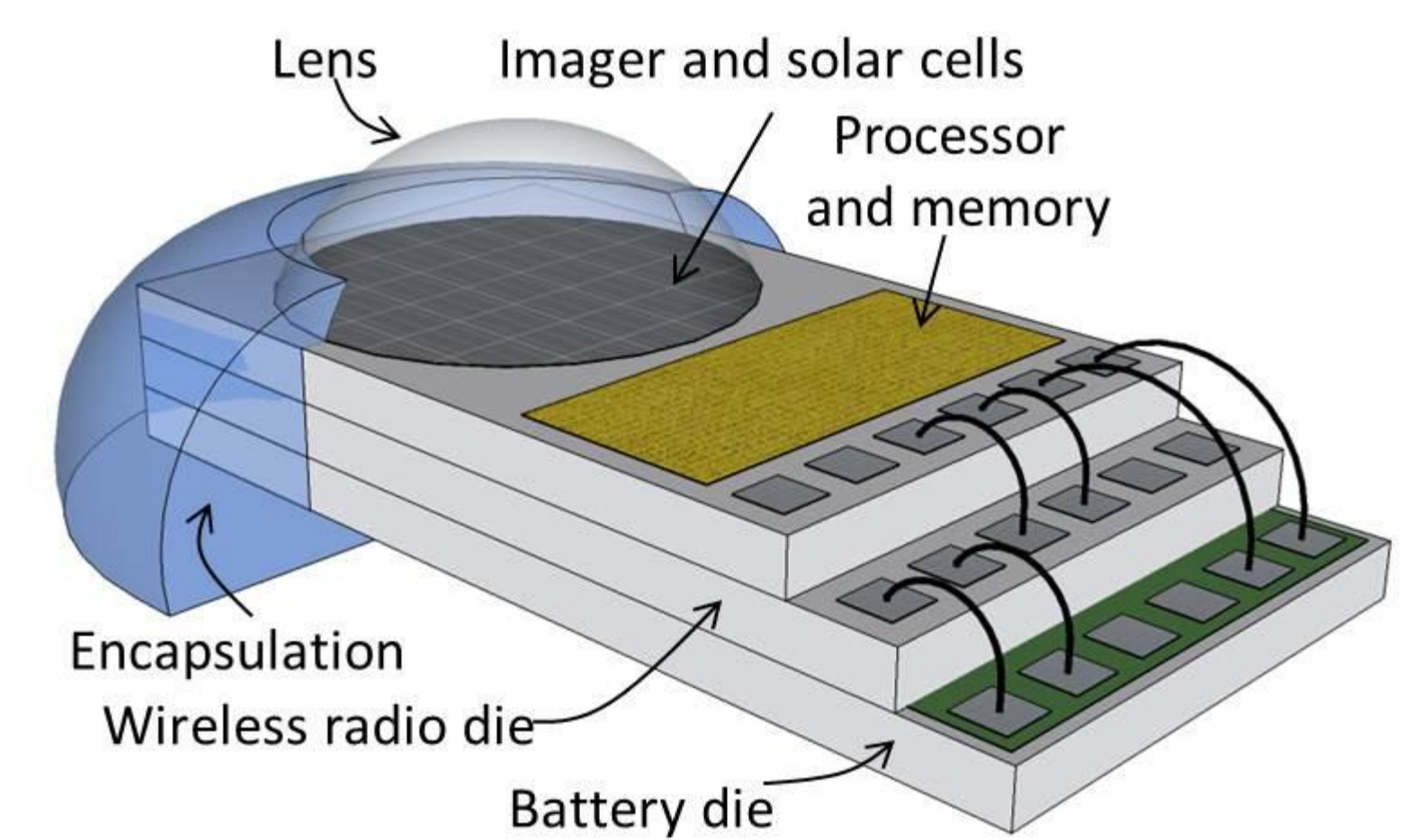# Remote Power Delivery

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Introduction: Power Delivery for Indoor Solar Energy Harvesting

- In recent years there has been a increase in the use of low power indoor embedded devices
- To power these devices there has been a push to use indoor solar energy harvesting, but there is commonly insufficient ambient energy to fully power said devices
- To solve this problem we have developed a system for powering said sensors using remote power beaming from a fixed location

## Problem Description: Creation of an Energy Delivery System

MAJOR PROBLEMS
- Power Delivery
- Servos
- Sensor Locating
- Power State Display
- User Input

- Accurately finding the sensors is a very difficult problem that requires precision from the servos and an algorithm to drive it
- Remote power beaming requires an energy source that is both low cost and high power

Proposed Solution: Servos and Algorithms

Components

- **LCD for Power State Display**

- **Sensor Emulation via Photoresistor**

- **LED Flashlight for Power Beaming**
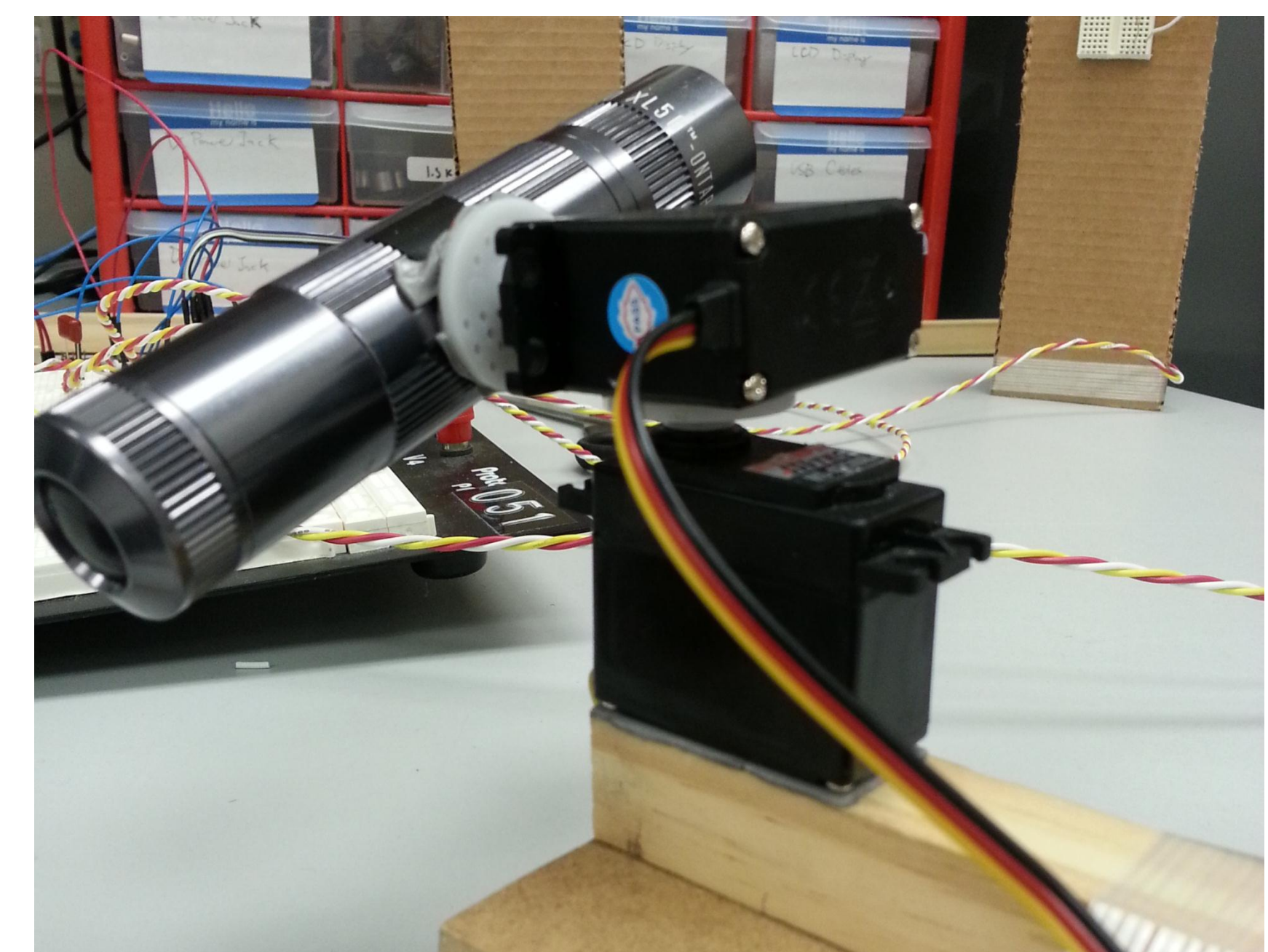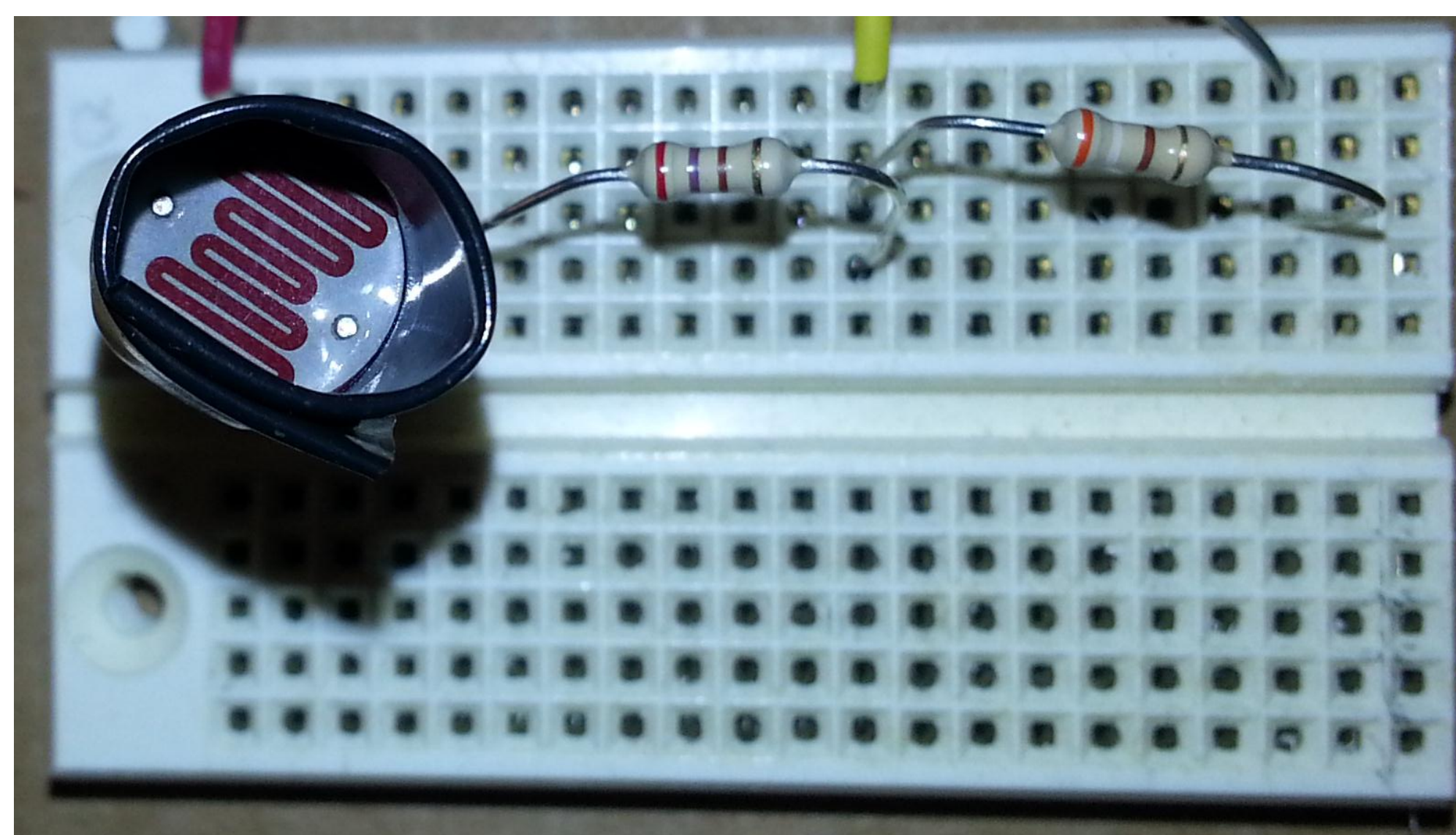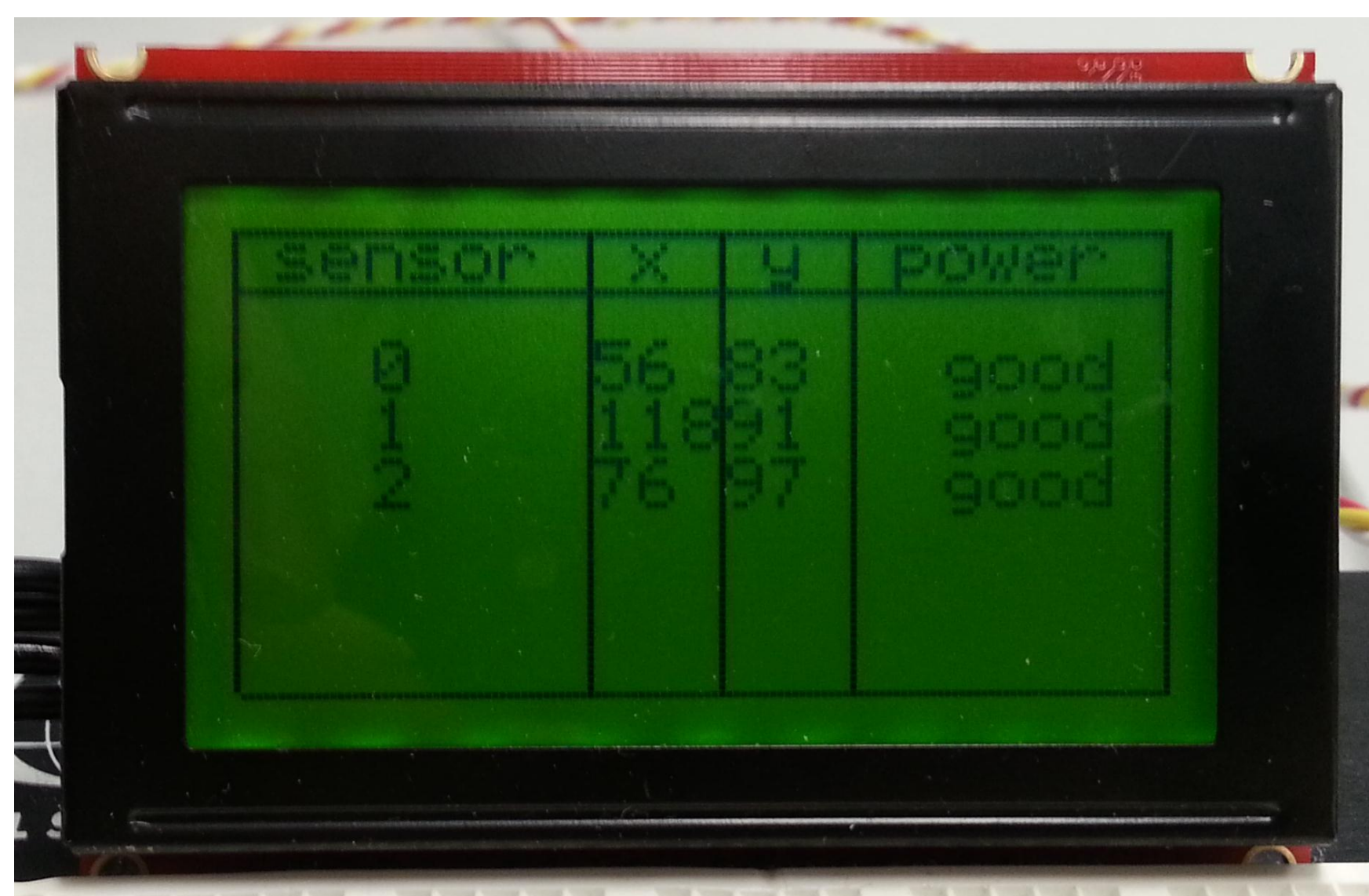
EECS 373 Topics and Other

- **Serial Interfacing**
  - Allows the LCD to display the current energy state of the simulated sensors
- **PWM**
  - PWM signal to control and aim the LED flashlight for power beaming
  - Used a 40Hz PWM signal with a duty cycle ranging from 0.6 ms to 2.3 ms
- **Interrupts**
  - Allows user input while other processes are running
- **ADC**
  - Used to measure the energy delivery to the simulated sensors
- **Circuit Design**
  - Created a switch board for user input
  - Used an LDO for the high current draw of the servos
- **Search Algorithm**
  - Designed and Implemented an algorithm for iteratively zeroing in on sensor location
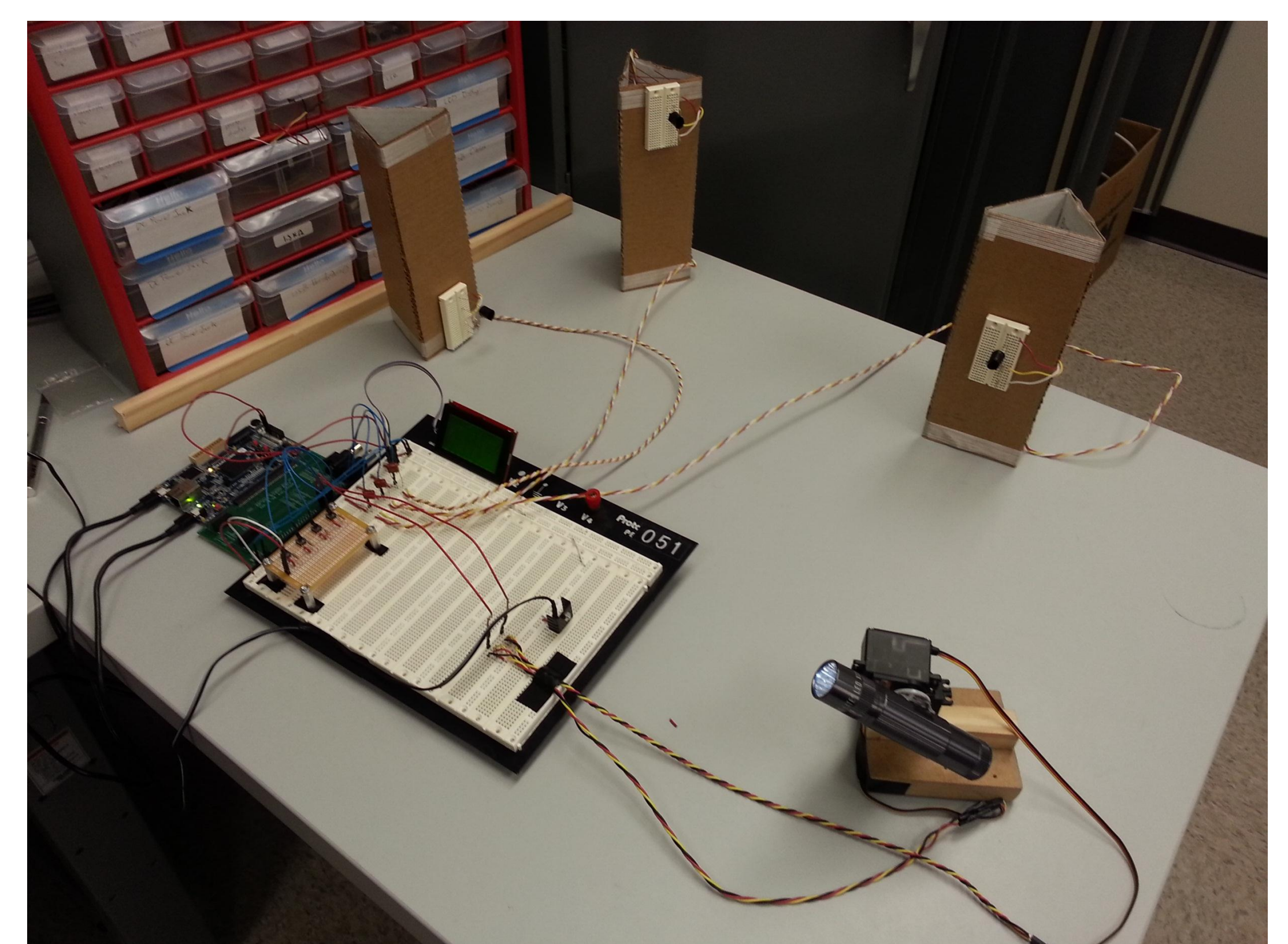
- **Future Enhancements**
  - Actual wireless sensors for longer range and realistic simulation
  - Improved algorithm able to detect moving sensors