

**EE / CprE / SE 492**

**Project title: Small-Form-Factor Solar-Powered Self-Sustainable IoT Sensors with  
Long-Range Wireless Communication**

**Feb 1 - Feb 13**

**Group number: 7**

**Client &/Advisor: Dr. Cheng Huang and Dr. Meng Lu**

**Team Members and roles:**

Calvin Condo - Solar Power

Qin Xia - Sensors

Chuxin Chen - Arduino / Sensors

Lun Zhang - Testing/Sensors

Yuchen Zhao - LoRa Wireless module/Arduino

Luke Healy- Testing/Sensors

**Where we left off:**

Last week, after meeting with our advisors, we were researching parts and putting together a parts list that we thought would help us this semester. Some of us also took the necessary online classes for laboratory safety so that we could begin to see the environment in which our device would be used.

**Bi-Weekly Summary:**

Instructor Meeting:

Our team met with the course instructor Md Maruf Ahamed, to discuss what we did so far and the plan for the future. We discussed implementing a temperature-only sensor for added simplicity and size, as our temperature sensor also measures Humidity, using a mini Arduino for smaller size, and testing our device in Dr. Lu's lab.

Parts List:

The parts that we decided we needed are as follows:

LoRa Wireless module            HC-12 433 SI4463 Wireless serial module

Light sensor	Adafruit ALS-PT19 Analog Light Sensor
Programmer	PGM-09825 AVR programmer
Temperature sensor	TMP36 analog temperature sensor

After asking the ETG for these parts, they actually had most of the parts available already. The only parts we will have to wait on are the LoRa serial modules. We will build up a testing circuit to test our light sensors in a biolab. We will analyse the data and we might need to calibrate it to get more precise value.

For the testing, we have built our prototype for testing. The prototype consists only of the array of light sensors soldered to a perfboard. There are wires that can be connected to an Arduino for testing so the testing station is not so clunky. We will be mixing certain chemicals that will produce a small amount of light, and have our sensor array detect the light from different distances away from the source. We are hoping this test will prove we have adequate components as well as the optimal distance to measure the exposed light.

### **Pending Issues:**

Most of the pending issues we had are still prevalent as we just recently got most of the parts we need. These issues still include power management, making the device smaller, and a lot more of our pending issues will be taken care of, now that we have the parts we need.

### **Team Contributions**

<b>Team Member</b>	<b>Contribution</b>	<b>Hours this Period</b>
Calvin Condo	Device Research, Laboratory Safety Requirements, Weekly Report, Parts List	17
Chuxin Chen	Device Research, Weekly Report	14
Qin Xia	Device Research, Weekly Report	14
Yuchen Zhao	Device Research, Weekly Report	14
Lun Zhang	Voltage Regulator Research, Lab Safety Requirements,	14

	Weekly Report	
Luke Healy	Temperature Sensor Research, Lab Safety Requirements, Weekly Report	14