

**EE / CprE / SE 492**

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

**Feb 27 - March 12**

**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:**

The previous week, we were able to start solid research on the power management portion of our device. We also had everything ready to start testing our light sensors in the lab to see if the sensors would be able to pick up the light emissions from the chemical reaction.

**Bi-Weekly Summary:**

We were able to get into the laboratory with the correct chemicals so that we could test the light sensors that we had. Unfortunately, the four light sensors were not strong enough to pick up the light from the experiment. With this information, our PCB design would have to change and we had to find a new sensor that could pick up the light emissions. We tried again with a more powerful sensor that theoretically should easily be able to read the light emissions, but we were not getting very good results. The sensor is strong enough, so we are tweaking the code so that it can read more precisely.

For the power, we met with our professor to show our planned design. He said the design was very simple and could use some optimization. He suggested using a charge management chip (MPPT - Maximum Power Point Tracking) and also consider using a battery instead of a super

capacitor. Since our meeting we have found a charge management chip and are still considering using a Li-ion battery, but we want to do a little more research to be sure on our design. After this week we will have decided which to use.

### **Pending Issues:**

A new issue was uncovered after our testing of our light sensors. We need to use a different light sensor than we originally planned for our device. However, the new light sensor would have a digital output which would be beneficial since the Arduino Mini does not have a built in analog reference. We still have the issue of figuring out how to encase our device.

### **Team Contributions**

<b>Team Member</b>	<b>Contribution</b>	<b>Hours this Period</b>	<b>Cumulative Hours</b>
Calvin Condo	Power	14	68
Chuxin Chen	Light Sensor Testing	14	56
Qin Xia	Light Sensor Testing	14	56
Yuchen Zhao	Light Sensor Testing, Sensor Code	14	56
Lun Zhang	Light Sensor Testing	14	56
Luke Healy	Light Sensor Testing, Sensor Code	14	56