

**EE / CprE / SE 491**

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

**September 30 – October 4**

**Group number: 7**

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

**Team Members and roles:**

Calvin Condo - LoRa Module

Qin Xia -Sensors

Chuxin Chen -Arduino

Lun Zhang LoRa Wireless module/Arduino

Yuchen Zhao - LoRa Wireless module/Arduino

Luke Healy- Arduino/Sensors

**Previous Week**

In the previous week, we met with our advisors and discussed the details of the project. We were given an Arduino Uno R3 to use for the sensors and Lora module. We discussed that the sensors would be provided to us, but then we decided we will research and order them ourselves in addition to the LoRa module.

**Week Summary**

This week we spent most of the time researching the different components for our project. We wanted to find a LoRa module (transmitter and receiver), a light sensor, a humidity sensor, and a temperature sensor. For the LoRa module we ended up with HC-12 433 SI4463 Wireless serial module. We will order two for one to act as the transmitter and the other as the receiver. The LoRa module has specifications we desire, such as communication distance and low power consumption. There are also numerous online sources for this specific module for us to reference.

The light sensor was and still is a variable component. We decided with our advisors to start with a Adafruit TSL2591 high dynamic range digital light sensor. Our goal is to eventually down

scale from this component and apply the individual board sensors to our own PCB design to save on power and size of the device. For the temperature and humidity sensor, we were able to find a joint sensor for both components. We have the same downscaling idea for this sensor, but for now we will use the DHT22 temperature-humidity sensor.

After finding the parts, we discussed them with Dr. Hunag and later placed the order for them through ETG (September 30th). We are currently writing a document of test cases for each of the components in preparation for when they arrive. Our plan is to find/come up with at least two test cases for each component.

### **Upcoming weeks**

The goal of the coming weeks is to test our components to familiarize ourselves with them, and to begin programming them for our actual project usage. We will have to rotate the use of the Arduino board throughout the week since we are only provided one. Calvin will use his own Arduino Uno with the one provided to test the LoRa module, as it will require one for transmission and one for receiving data. We will need to write up a schedule for when everyone will have the Arduino in the week. This will also help us track everyone's hours working on the project. We will also need to start writing specifications on what we want our components to do (e.g. take a temperature measurement every hour). Overall, our goals for the coming weeks are to improve on our documentation and make significant progress on our project!