EE / CprE / SE 491

Project title: Small-Form-Factor Solar-Powered Self-Sustainable IoT Sensors with

Long-Range Wireless Communication

October 28 – November 3

Group number: 7

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

Team Members and roles:

Calvin Condo - LoRa Module

Qin Xia - Sensors

Chuxin Chen - Arduino / Sensors

Lun Zhang - LoRa Wireless module/Arduino

Yuchen Zhao - LoRa Wireless module/Arduino

Luke Healy- Arduino/Sensors

Previous Week

In the previous weeks we tested our sensor components and began planning out our schematic. We had test plans ready for the LoRa module once it arrived and were ready to integrate the LoRa and sensors together.

Weekly Summary

We finally received the LoRa sensor this week and immediately began testing. We started by testing by giving both modules the same lines of code, so they would act as both a transmitter and receiver. Both modules were able to communicate through their respective terminals. Next we did the LED test described in the previous report. The test worked, so now we were comfortable to start integrating the sensors with the LoRa module.

We wired the humidity/temperature sensor, light sensor, and LoRa module to one of the Arduinos. Another Arduino was wired with just one LoRa module and coded to receive data whenever data was available. The transmitter code would take sensor measurements every two seconds, and send it over to the receiver. During testing we noticed that a lot of the data was being cut off. To fix this, we added delays between lumps of data being sent to ensure all data

was received. After we had it working successfully, we cleaned up the code to make it easier to read, edit, and use.

Once testing was complete, we began to layout the schematic for the PCB. The schematic would include the LoRa module and sensors, with the light sensors separated from the rest of the electronics via ribbon cable. Since the power aspects of the system is going to be done next semester, they are not included in the current design. We completed a general layout of the system and are now looking for ways to make the design more efficient.

Pending Issues

There were no pending issues from this week.

Team Contributions

Team Member	Contribution	Hours this Period
Calvin Condo	Testing and schematic design.	9
Chuxin Chen	Testing LoRa module	7
Qin Xia	Testing, light sensor research	7
Yuchen Zhao	Testing LoRa module and sensor	7
Lun Zhang	Testing LoRa module	7
Luke Healy	Testing, light sensor research	6

Upcoming Week

For the upcoming weeks, we want to start finalizing this semester's work by creating a final design and improve on areas that need/can be improved. We have a lot of wasted space and power consumption on the Arduino for components not being used. We want to find a way to fix that if possible. Additionally, we want to create a simple prototype to present during our review presentation.