CprE/EE/SE 491-- sddec20-23

Underwater Algae Bloom detection
Semester 2 week 2
8/30-9/12
Client: Santosh Pandey
Faculty Advisor: Santosh Pandey

Team:

Anastasia Golter -Housing Team
Nicholas Stasi - Sensor Team
Emily Kinne - Sensor Team
Zachary DeMaris - Housing Team
Jack Seiter - Communication Team
Andrew Koenen - Sensor Team

Overall Summary:

The past two weeks have been very successful as previous issues have been resolved and some unexpected good news came in with the PCBs shipping early. The second week in the sprint has mostly consisted of obtaining more parts for the project including items for the float, the sensor boards, and progress with cellular communication. Overall our split-up of the housing, sensor, and wireless communication teams has done well for us.

Individual Contributions:

These are the descriptions for individual contributions for the two weeks of this reporting period: 8/30-9/12

Anastasia Golter: This week I went to Home Depot with Zach and we bought supplies to make the float for our project. We cut and assembled PVC piping and waterproofed a wooden board with polyurethane. We also have the tubing but we are waiting to discuss with the team how the PCBs will look so we know where to drill holes in our board. From there, we will add a waterproof box to the top of our float for the PCB to go in and appropriate tubing. This week we started assembly of the structural component of our project.

Bi-weekly total: 7 hours

Nicholas Stasi: This week I researched and selected a battery and battery charger that fits the requirements of our project. We ordered these parts and they should be here early next week. I also reserved an oscilloscope for us to use next week from ETG. Emily, Andrew, and I also were able to get a chained i2C connection to work for 2 different sensors and wrote some preliminary python code to read and display the data. I also helped Jack get the FOMA cellular board to power on and we were able to Putty into it allowing us to program it. I also soldered a bunch of pin headers to our breakout boards.

Bi-weekly total: 9 hours

Emily Kinne: This week I worked with Andy and Nick to test multiple sensors on the same i2C wire. We downloaded and installed various python libraries on the raspberry pis. These were from adafruit for 2 of the breakout boards: the light sensor and accelerometer. We were able to view both sensor's data from the same wire by modifying the time intervals of the code.

Bi-weekly total: 6 hours

Zachary DeMaris: This week I have been going over different ideas for the structure of our floating sensor array. I have visited multiple hardware stores to get ideas. This last weekend Chloe and I went to Home Depot to buy the parts for our first prototype of the flotation device. We purchased PVC and a wooden platform. We treated the wood to make it waterproof and built a 2x2 square out of PVC for the wood platform to sit on. In the coming week we plan to find containers for the electronics as well as drill holes in the platform to feed tubing for wires through.

Bi-weekly total: 7 hours

Jack Seiter: These last two weeks I worked on getting the FONA 808 connected to our cellular provider. The FONA 808 is controlled exactly like an older modem and uses a poorly documented command set, so much of my time was spent trying different commands and locating resources. I was able to make the FONA 808 search for the 2G network on startup, but I suspect that the 2G signal is unreliable within the walls of Coover. Once it stops raining during the day I'll try running it outside.

Bi-weekly total: 10 hours

Andrew Koenen: This week I worked on setting up and configuring a raspberry pi to have all the necessary libraries to communicate with I2C devices. I also found some premade libraries with specific code to communicate with our sensors. Next, I started connecting the sensors to the PI with Emily and Nick, trying to get readings from multiple sensors connected to the same wire. We then created a little test project displaying the data from both sensors and got it successfully working. I also got the boards ordered and picked them up to prepare to solder them in the coming weeks.

Bi-weekly total: 8 hours

Pending Issues:

For the sensor team, We need to compile the parts to solder onto the boards and decided on a time to use the oven as it is now on an appointment-only basis.

Plans:

Pertaining to the boards, Emily, Nick, and Andrew will be grouping up all of the surface mount pieces to be soldered onto the board and then set up a time to get them into the ovens. Along with this, they will continue using some breakout boards to help develop the code and wiring setup for the overall system. The hope is that once the boards are soldered the code will be developed to a point at which the boards can simply be put in for the breakout boards.

Jack will continue to work on cellular communication and troubleshooting the issues with the connection inside the building or attempt to test outside.

Pertaining to the housing, Zach and Chloe will be finding waterproof containers to attach to the floating platform we have built. We also will be drilling holes in the surface of the wood platform to feed the wire tubing down into the water. We need to collaborate with the sensor team to find the right diameter of tubing and the right size of waterproof containers.