**WEEKLY BLOG POSTS: PETER DORICH**

5.1.1 Fall

5.1.1.1 Week 1

Read through projects and decided which to pursue.

5.1.1.2 Week 2

I was assigned a project and reached out to contact group members as well as our client, Chet Udell. Set up weekly

meeting with Chet.

5.1.1.3 Week 3

Worked on problem statement individually and as a group. I didn’t have enough information to complete it, so we

discussed the project more specifically with Chet. Met with TA, he had concerns about the project’s scope and size,

thinking it might be too big. Turned in Problem Statement report.

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5.1.1.4 Week 4

Sent Dan, our TA, access to our OneNote page to read our blog posts. Setup our GitHub page, sent access to McGrath.

5.1.1.5 Week 5

Did project planning, including the creation of user stories. Had a very important meeting with Chet where we discussed

project specifics, including software tools, microcontroller models, methods of communication, and weatherproof

housing ideas. This meeting’s content guided our development for the rest of the year.

5.1.1.6 Week 6

Worked with group on Requirements document. Chet cancelled our meeting for the week, so we planned to recieve the

final details for our report by week 7. Put in hours of work with Chris to get the document done.

5.1.1.7 Week 7

Chet has requested we begin work on the project at this point. I completed introductory coding excercises related to our

new tools in order to prepare for the project. This included getting two micro-controller boards to turn on and off an

LED light over LoRa.

5.1.1.8 Week 8

Completed and turned in Technology review. Attended a very important meeting with Chet and David Jurado from

P&R Surge Systems over skype. David walked us through setting up the new irrigation valve. He explained to us the

important features of the PCB and the half-open method the valve uses.

5.1.1.9 Week 9

Met with Chet and discussed more project details and development tactics. Chet explains the ”iterative design” tactic

that the OPEnS lab uses. This strategy essentially entails that we always be developing and changing things often if

they don’t work. This method doesn’t quite work with capstone document requirements, but we found a good middle

ground to continue.

5.1.1.10 Week 10

Design document work. Turned in design document. Worked on our video progress report presentation, and turned it

in.

5.1.2 Winter

5.1.2.1 Week 1

Reached out to Chet Udell and setup our weekly meeting for the term. Reached out to Dan as well and setup our weekly

TA meeting.

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5.1.2.2 Week 2

Did research on Adafruit Ethernet Shield. Soldered stackable headers onto Adafruit 32u4 with LoRa. Soldered headers

onto ethernet shield. Met with Chet, discussed Technical goals for the next two weeks.

5.1.2.3 Week 3

Finished setting up Ethernet Featherwing, and received a valid MAC address for the hub, allowing it to connect to

Ethernet on OSU’s OPEnS network. Setup an Adafruit.io dashboard to retrieve information from the Hub. Brief meeting

with Chet Udell, we mostly showed off demos of our work thus far and laid out next week’s goals.

5.1.2.4 Week 4

Worked with Chris to send messages between the ”valve” and the Hub. Setup a textbox Adafruit.io feed in order to send

information from a browser to the hub. Tested LoRa communication and data display. Finished hooking up Adafruit.io

with arbitrary values transferring.

5.1.2.5 Week 5

We showed Chet a demo showing the ability for our devices to transfer values back and forth, including the RSSI value,

which then was uploaded to Adafruit.io Chet introduced us to the Open Sound Control Library (OSC), which will allow

us to send formatted string bundles over LoRa. I talked with lab members about the OSC library and how to implement

it into the hub.

5.1.2.6 Week 6

Two demos were planned. One will show the valve opening/ closing by sending signal to the relays. The second will

be to transfer soil data to the Adafruit.io dashboards in the correct way. Dan, our TA, said that he would like an Alpha

demo by week 8. Also Dan would like an extremely rough draft for our poster.

5.1.2.7 Week 7

General lab work was completed. Working on the control loop for the Hub, figuring out timing issues for listening for

messages versus sending them. Worked with other lab members on the OSC library. Figured out the specifics about

building bundles and adding data. Still need to figure out how to efficiently break down bundles and publish to

Adafruit.io.

5.1.2.8 Week 8

Meeting with Chet Udell on Friday. We showed him an alpha build for our project. Worked with the OSC library, trying

to implement it into the hub framework. The OSC library can’t be used over Adafruit.io, so I created my own formatted

string that can be transfered between the Hub and the UI over MQTT. This string will contain the values used to control

the valve parameters. There was also an issue with sending messages back and forth between the valve and the Hub.

I believe the hang was happening on the valve end, but after some testing and logic restructuring we had it working

reliably.

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5.1.2.9 Week 9

Showed Chet a Demo of our project thus far. We implemented the OSC library and were able to show off working

acknowledgement messages.

5.1.2.10 Week 10

Met with Chet to discuss the term’s progress and next term’s goals. We added some feature additions as stretch goals,

and discussed project changes. We informed Chet about the issue with the 32u4 boards, and announced our decision to

opt for the M0 board instead, which is strikingly similar.

5.1.3 Spring

5.1.3.1 Week 1

Added functionality to the hub to update the valve’s real time clock. Met with Chet about deploying our valve at LB

farms.

5.1.3.2 Week 2

Met with Chet to talk about putting the valve in a sleep state. Set goals for week 3, including a sleep experiment. Add

a manual mode to our functionality list. We had another Skype demo with P&R surge as well, where David made

suggestions and announced he would be flying out to visit our Expo booth.

5.1.3.3 Week 3

Met with Chet and discussed goals for the next two weeks before Expo. Chet wanted to see a demo where he would

be talked-through our UI, controlling the valve himself. Chet also wanted to view our poster, and implement requested

changes. Worked on integrating valve electronics into the valve case.

5.1.3.4 Week 4

Worked on poster, requested permission from P&R to use their logo. Added the OPEnS logo.

5.1.3.5 Week 5

Completed the walk-through demo with Chet. Recorded feature requests and other things of note, all to be implemented

by the following week before expo.

5.1.3.6 Week 6

We worked to implement the combined mode of functionality. Also tried to brainstorm ways to show off our project

at expo, including setting up a base station in the OPEnS lab or even spoofing an MQTT connection. There will not be

LoRa communications in Kelly for the Expo, it will be too crowded.

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5.1.3.7 Week 7

Chet accidentally double booked the meeting so we decided to continue work on our Expo setup. I did work contacting

multiple network administrators to try and get a valid MAC for the computer lab in Kelly for our demo. After contacting

numerous people I was told there would be someone to assist me the morning of expo. Expo was also completed that

Friday.

5.1.3.8 Week 8

I was unable to attend the meeting this week due to a proctored midterm. The group discussed a final demo with P&R

surge systems for week 10 over Skype. We learned in class that our final documentation and final progress report is due

during finals week. Talked to Chet about the regulator for the solar panel in the valve. This is an extra addition that I

will be completing. The addition will allow the built-in solar panel to charge our electronics.

5.1.3.9 Week 9

Attended a demo with P&R Surge Systems over Skype. We met with 3 different employees of P&R, and we walked

them through our entire project, showing them the ins and outs. We had them download the UI, sign in to Adafruit.io,

and they watched the valve turn through on video after pressing a button on their end. They were very impressed and

want to continue work on the project.

5.1.3.10 Week 10

Final project wrap-up. The group will continue the project this summer, but will take a 3 week break from development.

The group worked together on the Video Presentation and the Progress report.