EE/CprE/SE 491 WEEKLY REPORT

Start Date – End Date: 11/15/2024 - 11/21/2024

Group number: sdmay25-18

Project title: Weather Triggered Wireless Telemetry System

Client &/Advisor: Daji Qiao and Sarath Babu

Team Members/Role:

1. **Alex Chambers:** Individual Component Designer
2. **Alexander Christie:** Client Interaction
3. **Adam Fields:** Data Formatting
4. **Nisha Raj:** Team Lead
5. **Aidan Gull:** Component Integration
6. **Colin Kempf:** Documentation

Weekly Summary

This week our focus was on getting scripts working and communicating with our advisor and client about our ideas for how we want to move forwards with the project. We initially created both the scripts for collecting live weather data and the wireless signal data from ARA. These scripts will both take time to run in order to get as much data as we need to create accurate measurements. We then spoke with our advisor about how we were hoping to move forwards with the project. This included ideas for working around API predictions in order to get better accuracy and avoid using third party software by collecting the data we need live, and only storing what our feedback loop algorithm dictates is a weather event. This idea was approved, as it would gather the most accurate data and allow ARA to create a baseline historical weather data set for each data collection point. Additionally our advisor explained that in the long run, the API predictions should be a different experiment run through ARA. This experiment would be able to use our data collected from live weather events to help verify weather predictions and determine accuracy. While this may end up being apart of our project next semester if we have time, our advisor encouraged us to work on our new idea to collect and store accurate data without relying on third party APIs.

Past week accomplishments

- **ARA Scripts**
  - Finalized and began to run collection for both live weather data and wireless signal data
  - These will run for an extended period of time to collect a large amount of data and will be monitored in case there is an error with the script
- **Brainstorming Project Changes**
  - Came up with a new solution for our project based on problems we encountered with ARA's system limitations and information we received from our client and advisor

- ○ Presented our idea to our advisor to get feedback on if it was a feasible direction to take our project and get approval
- ○ Once we had received approval on this new direction, met with our group to discuss what changes will need to be made to reflect our switch in approach
- ○ Worked to make new designs and concepts about how our new direction will function

Pending issues

- At this point in time there are no pending issues

Individual contributions

NAME	Individual Contributions	Hours this week	HOURS cumulative
Nisha Raj	-Worked with team to discuss final presentation details and prototyping -Discussed the limitations of our current prototype and how to move forward with a revised implementation -Worked with getting logged into base station that will allow access to wireless signal data	6	65
Alexander Christie	-Discussed faculty presentation and prototype with the team -Worked on formatting website to meet standards for final presentation -Met with the team to discuss design alternations to prototype	6	64
Aidan Gull	- Meet with our advisor to discuss new solutions to the current threading problem. - Meet with the team to create new solutions to problems with threading.	6	64
Colin Kempf	- Brainstormed with the group on solutions to issues in our design occurring from ARA limitations - Met with our advisor to present our new solution. Worked with them to finalize our new idea and determine what would be feasible - Worked with the group to create new designs and documentation for our new solution	6	64
Alex Chambers	- Began planning out new solution to project problem - Met with advisor to propose new solution to project problem - Began working on data formatting script	6	66

Adam Fields	- Brainstormed with the group on solutions to issues in our design occurring from ARA limitations - Discussed the limitations of our current prototype and how to move forward with a revised implementation	6	64

Plans for the upcoming week

- **Create New Prototype**
  - Based off of the two scripts we have running, create a new prototype which gathers ARA weather data and wireless signal data
  - Use this collected data to begin creating an algorithm which is able to take in data from a period of time and look for weather events based on previously recorded data
    - This overtime will create a feedback loop, but initially we will have to more manually select which datasets we tell the algorithm to represent what weather events
- **Revised Documentation**
  - Overhaul our documentation to reflect our change in design
  - In our documentation, explain why changes have been made and how our old ideas will still be useful in future experiments

Summary of weekly advisor meeting

We had two meetings this week. The first was on 11/15 where we met with our client and advisor and discussed several questions we had that we wanted answered moving forwards. These included questions about data storage, existing historical data that ARA might have, and what kind of priority our program will have on the ARA framework with other users. This meeting led to some interesting discussions about how our project might move forwards in order to achieve the best possible end product. It also sparked some new ideas for us, but before we could reach any conclusions, some things needed to be tested, both by us and by our advisor. Our second meeting took place with just our advisor on 11/20, where we presented some of our ideas for changes in our project with a focus on getting as much accuracy as possible for the data collection system.