EE/CprE/SE 491 WEEKLY REPORT

Start Date – End Date: 10/25/2024 - 10/31/2024

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 last week our group focused on collecting more data and improving our data visualization. Over the weekend we ran our prototype to begin gathering forecast data for us to use. Our prototype encountered a few major bugs, so we shifted our focus to debugging. Since the prototype takes many hours to run before encountering a bug, we tested multiple solutions on the server. We eventually found a fix that worked, and continued to let it collect data. We also fixed a separate issue in the prototype having to do with time zone changes. Once we had successfully gathered data we formatted it into 3D graphs and created a presentation for our next client meeting going over our analysis of the models we had made. We also did research on APIs which we presented at our last meeting. This research helped us solidify the APIs we are using to gather forecast data and the pros and cons of which ones we are using.

Past week accomplishments

- **Prototype Debugging - Alex Chambers, Alexander Christie, Colin Kempf**
    - Fixed an issue occurring with time zone differences
    - Fixed a major issue with data collection stopping even though the prototype continued to run
        - Issues occurred with the scheduler for the pull calls to the APIs
        - Data collection now works for as long as we need it to and allows us to gather forecast data successfully
- **Data Visualization - Alex Chambers**
    - Used our gathered data to make new charts based on feedback from our previous client meeting
    - Created documentation for the graphs giving an insight into our analysis about what the graphs could tell us
    - Began to consider how these graphs could inform us in our next step of the prototype
        - Looked for what data features would be the most useful and accurate

- **API Research - Colin Kempf, Alexander Christie**
    - Researched two new APIs, AccuWeather and WeatherAPI
    - Came to the conclusion that neither of these would suit our project well
        - AccuWeather has strong limitations unless the service is paid for
        - WeatherAPI only gets daily forecast data, not hourly
    - This has helped us, along with our existing research, to solidify the APIs we are using given our bounds for the project and what APIs exist that would be available for us

Pending issues

- At the current moment there are no major pending issues that we are having. We managed to find and solve a pretty big issue this week, but nothing other than that has popped up.

Individual contributions

NAME	Individual Contributions	Hours this week	HOURS cumulative
Nisha Raj	-Focused on breaking down and analyzing the functionality design of our project plan -Investigated prototype output files on the server -Pushed prototype code to the main senior design GitHub	6	45
Alexander Christie	- Ran Prototype on server over weekend and monitored results. -Collaborated with the team to troubleshoot and determine solutions to Prototype bugs. -Researched API alternatives to confirm current selection.	6	46
Aidan Gull	- Created a new gantt chart, dividing up project tasks further. - Analyzed output files from the weather api prototype.	6	46
Colin Kempf	- Helped debug and solve the bug in our data gathering prototype code - Researched new API alternatives to get a better understanding of what our other options were	6	46
Alex Chambers	- Worked on debugging errors in Data Gathering Prototype - Updated Data Visualization Script to look at the aggregate accuracy of various forecasts instead of individual forecast - Began working on a new version of the Data	6	48

	Visualization Script that visualizes forecast data in a 3d graph		
Adam Fields	- Collaborated with team to troubleshoot bugs in prototype - Helped identify potential risk factors with regards to the system and developed ideas to mitigate them	6	45

Plans for the upcoming week

- **Present Data Visualization**
    - During our next client meeting, we want to show our new charts and our analysis of our data
    - This feedback will inform a lot of what we turn our focus on, depending what our client thinks about our findings and the data the APIs get
- **Prototype Prediction**
    - Based on our gathered forecast data, formulate what features will help our program predict upcoming weather events most accurately
    - Incorporate this into our prototype and use it to begin informing the ARA Framework when to start recording live weather data

Summary of weekly advisor meeting

For our meeting with our client and advisor on 10/25 our group really focused on continuing to present our findings from data analysis. We took the feedback we had received from our last meeting about the graphs we had presented, and created new graphs in the hopes of better demonstrating our findings and making them more readable to an unfamiliar audience. We received further feedback on these graphs and came to a better understanding between us and our client about what our graphs were showing, how they could help us, and what the client was looking for. This feedback will help us create better graphs for our next meeting, showing more of what the client asked for in the visualizations. We also showed off the new API research we did, and explained our findings.