

EE/CprE/SE 491 WEEKLY REPORT

Start Date – End Date: 10/10/2024 - 10/17/2024

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 goals focused on design and moving our prototype onto a server. For our first goal, we really wanted to nail down with our client who our users were and what our requirements should be. While our group had already come up with many of these on our own, we wanted to have a formal discussion about it. The feedback from this discussion enabled us to break down the parts we were missing and create a final list for us to work off of as the project continues. For our second goal, we put our prototype for gathering data from weather APIs onto a server. This allows us to now run this code consistently for a longer period of time than it could on one of our laptops. We are letting this program run for the rest of the week, and assuming there are no issues, we will be able to have a large sample dataset from the week to work with going forward.

Past week accomplishments

- **Finalizing Project Details**
 - Users & Needs
 - Only two types of users, Internal and External
 - Internal users are users who work for ARA
 - Likely ARA researchers
 - They have access to ARA software directly and can modify it
 - They need to be able to use our program so they can collect and publish data, as well as analyze how well their hardware performs
 - External users are users who are outside of ARA
 - These users are likely researchers from other universities
 - They do not have access to ARA software directly and cannot modify it

- They need to be able to use our program in order to collect weather data for their own research projects. They also need to be able to easily query and visualize the data from our program.
 - Requirements
 - Determined functional, resource, aesthetic, and user requirements
 - Focused on making our requirements specific and exact, while still easy to follow, giving clear guidelines
 - Made sure that the requirements encompassed all areas of the project
- **Putting Prototype on Server - Alexander Christie, Adam Fields**
 - Acquiring server space
 - Running the code
 - Configured VM with necessary packages that the code is dependent on.
 - Test run for code lasting 12 hours, stored all outputs within file hierarchy within VM.
 - After confirming a successful test run the code was scheduled to collect for half a week. This will give us:
 - Broad enough data to begin narrowing accuracy of weather APIs
 - Plenty of function calls acting as a preliminary stress test

Pending issues

- No major issues came up this week that still need to be solved. We also dealt with our issues from the previous week, figuring out the server, and clarifying the ARA Framework data discrepancies with our client.

Individual contributions

<u>NAME</u>	<u>Individual Contributions</u>	<u>Hours this week</u>	<u>HOURS cumulative</u>
Nisha Raj	-Worked with the client to identify future users for the project -Worked on deriving requirements for our project from the user needs -Categorized requirements based on functional and nonfunctional -Worked on the design document	6	34
Alexander Christie	- Configured virtual machine to have all dependencies for current working model - Scheduled script to run to collect preliminary data	8	34
Aidan Gull	- Helped finalize users and needs for the project. - Helped finalize requirements for the project.	6	34

Colin Kempf	- Determined our users for the project and how we could consider their needs as we design the prototypes - Determined requirements, both functional and non-functional, for the project and more specifically the ones to keep in mind for the prototype	6	34
Alex Chambers	- Created updated component decomposition graph - Helped finalize requirements for the project	6	36
Adam Fields	- Acquired the virtual machine for testing our software - Helped with configuration of the virtual machine	8	33

Plans for the upcoming week

- **Continue Prototyping**
 - Work on taking gathered forecast data and determine how to predict when the next weather event will be
 - Once the program has determined its next prediction, implement the next steps of the predict & gather data diagram
 - Continuing to check forecast data for prediction changes
 - Pulling from ARA Framework live data to gather data for the lead-in time onwards, and to check if the weather event starts early or if one goes unpredicted
- **Analyze Forecast Data**
 - Once we have let our prototype for gathering data from the forecast APIs run for a long period of time on a server, we can analyze it, looking for what might benefit or harm our program. Specifically we can look for:
 - Accuracy over time
 - Data collection errors (missing data, incorrect formatting)
 - Types of weather events
 - How data changes during weather events
 - Storage space of collected data

Summary of weekly advisor meeting

This week we met with our client and advisor on 10/11. During this meeting we presented our prototype for gathering data from different weather forecast APIs. We walked our client through how we were pushing/pulling to these APIs and how we could format the data once gathered. We also showed some of the data we successfully gathered during our tests. We discussed what our next steps would be from this prototype, including putting it on a server and building off of the prototype to actually begin predicting weather events. Our group also talked with our client about clarifying who our users were and what kinds of requirements our project has beyond the ones our group already had outlined and might have missed. We came to the conclusion that we have two users, an internal ARA researcher user, and an external researcher user. Their needs are very similar but their motivations for those needs are different, as well as their access to ARA software.