

Weather Triggered Wireless Telemetry

Lightning Talk Project Planning

Group: sdmay25-18

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Project Overview

- ARA is an advanced wireless research platform covering Iowa State University, Ames, and nearby rural areas.
- Tasked with creating a system that will recognize and predict when a weather event is occurring.
- This trigger, signals data collection before a given weather event has begun and allows us to continue collecting data until the weather event has passed.
- This weather data will eventually allow researchers to determine how the performance from the ARA framework differs during different weather events.



Agronomy Farm



Wilson Hall

Problem Statement

- Want to intelligently collect a wide range of network data during a variety of weather events.
- Use forecast data to predict future weather events to gather data only when weather events we want to record are going to occur.
- Store collected data and allow for user queries to access and format selected data.

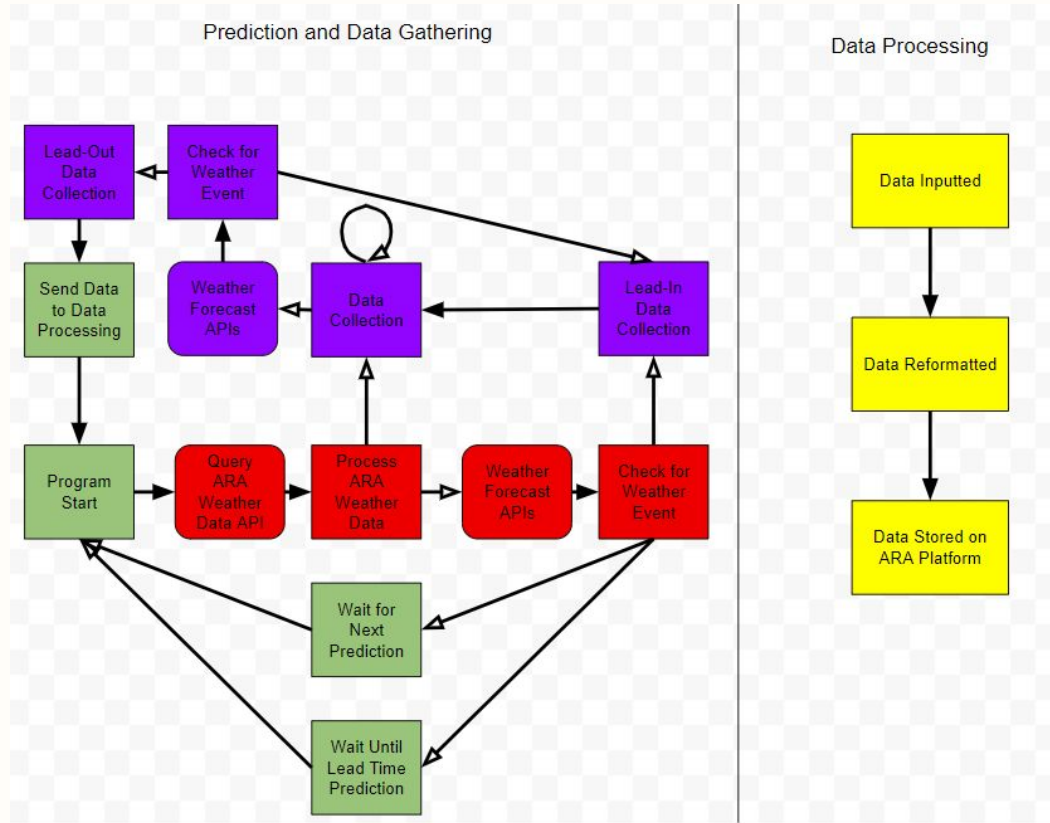


Project Management Style

- **Agile Methodology**

- Team meets with advisors and clients weekly
- During meeting team presents what was accomplished the previous week
- The advisors discuss what expectations and next deliverables for the upcoming week
- The team works on deliverables for the following week each week
- Each sprint is one week long

Task Decomposition





Key Milestones

- Collect weather data using weather APIs
 - Initial prototype completed 10/14
- Use the collected weather data to create graphs that show the difference in prediction and actual weather at that time
 - Prototype with visuals by the end of October
- Software triggering collection of data and storing in specified format including graphs visuals
 - Initial prototype by the end of 1st semester
- Final software including querying UI and analysis of weather data
 - Product demo in April

Key Metrics

- Collect data 80% of the time during what we consider a weather event
 - Implemented in initial prototype
- 90% of the time the actual weather at a given time will be accurate in comparison to the predicted weather data 1 hour out
 - Implemented in prototype at the end of 1st semester
- Collect data 30 minutes before the weather event with 30% variance in collection start time
 - Implemented in prototype at the end of 1st semester

Key Criterias

- Functionality:
 - Ensure the software has all the dedicated functionality from our requirements
 - Weather event correctly predicted and triggers data collection
 - Data collected and stored in file hierarchy
- Client satisfaction:
 - The software needs to meet the users needs
- User Experience:
 - Users need to have a usable UI in order to query weather data

Key Risks and Risk Mitigation

- Risk 1: Increase Storage Space & Costs
 - Mitigation: Decrease excess lead-in time, gathering unnecessary data, by having accurate predictions
- Risk 2: Inaccurate Data Collection
 - Mitigation: By using local devices to measure weather data and incorporating methods for false positives and negatives
- Risk 3: Creating Hardware Malfunctions
 - Mitigation: Ensure our program is thoroughly tested before merging it with the ARA servers and currently existing applications on their hardware

Conclusion

We have identified:

- Project Management Methodology
- Task Decomposition and Breakdown
- Key Milestones
- Key Metrics
- Key Criterias
- Risks and Mitigations