CO_2 Software Design Review
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Sponsors: Dr. Andrew Richardson and Dr. Mariah Carbone
Mentor: Ana Steinmacher

Introduction

- Climate change

- Accurate data collection

- Importance of forest in carbon cycle

- Measuring respiration in organisms

- CO_2 is a major greenhouse gas

Sponsors

- Dr. Andrew Richardson

- Dr. Mariah Carbone

- Ecologist

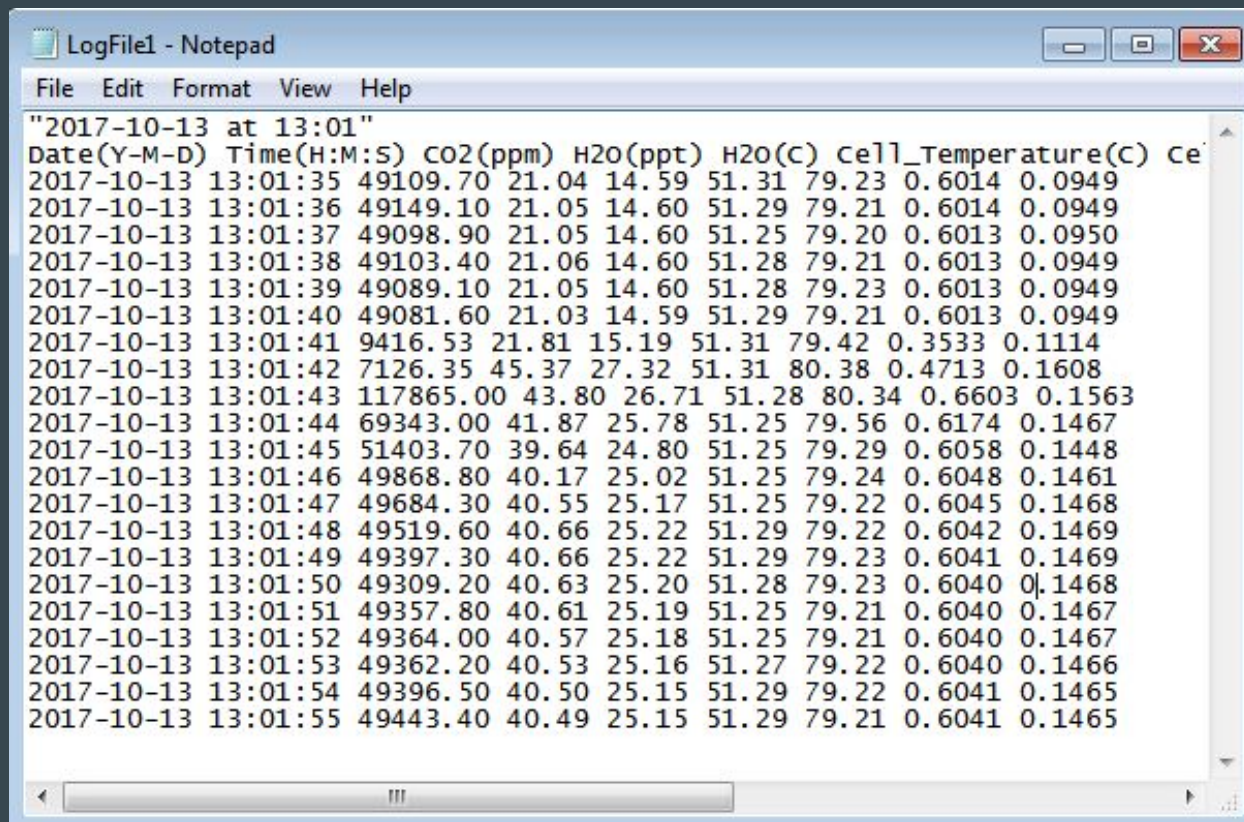- Study balance of carbon uptake and release in trees and microorganisms
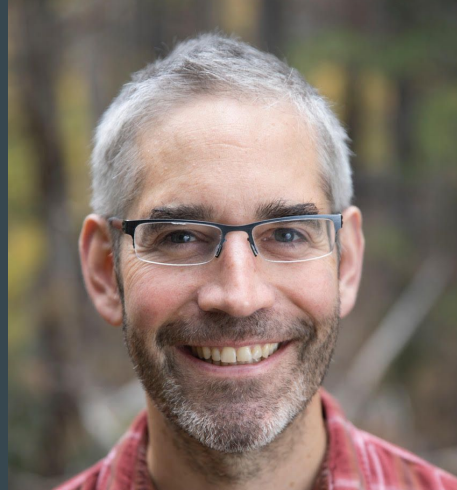
Problem Statement

- Ecology research at NAU

- Taking CO_2 readings from trees

- Current solution

  - Outdated Windows Software

  - Slow

  - Cumbersome

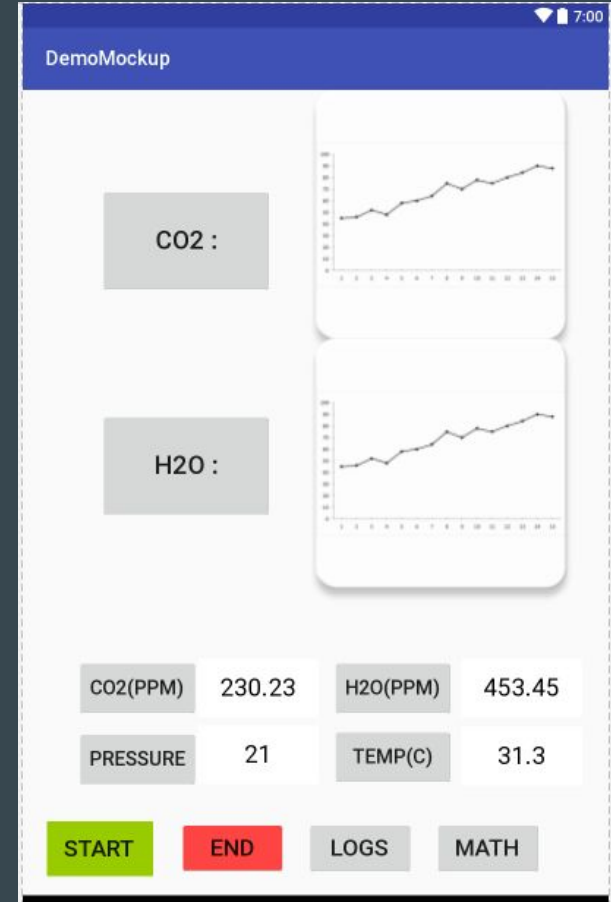 - Data is difficult to read

Data Output

Functional Requirements

Our Solution will be an Android Tablet Application :

- Logging Individual Subsets of Data

    - Gas Analyzer provides live data output

    - User begins and ends logging of data stream

- Metadata

- Adjustable Data Display

    - User can toggle which values are shown
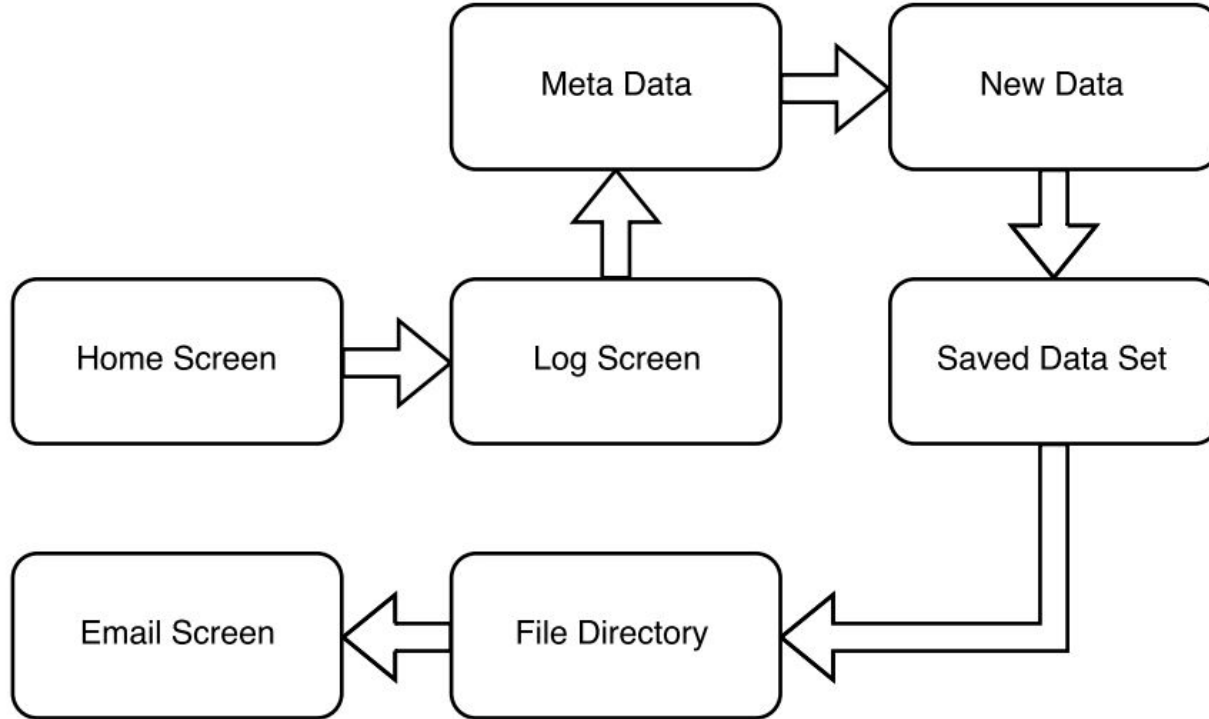
- Statistical Computation

Non-Functional Requirements

- Mobile
  - Run on 7" Android Tablet
- LI-840A gas analyzer
  - Serial port connection
- Real time data reporting
  - Android GraphView Library
- Transfer readings out of app
  - Basic Email Implementation

Application Flow

LI-840A Gas Analyzer

- Sponsor's current hardware

- Numerical output

  - CO_2

  - H_2O

  - Pressure

- Serial to USB connection

Android Tablet

- 7" Android Tablet

- Screen real estate

- Low cost

- Simple development

Data Transferring With Email

- Ubiquitous

- Not dependent on other software

- Simple integration with Android

- Choice of email client

Distributable

- Free and open-source

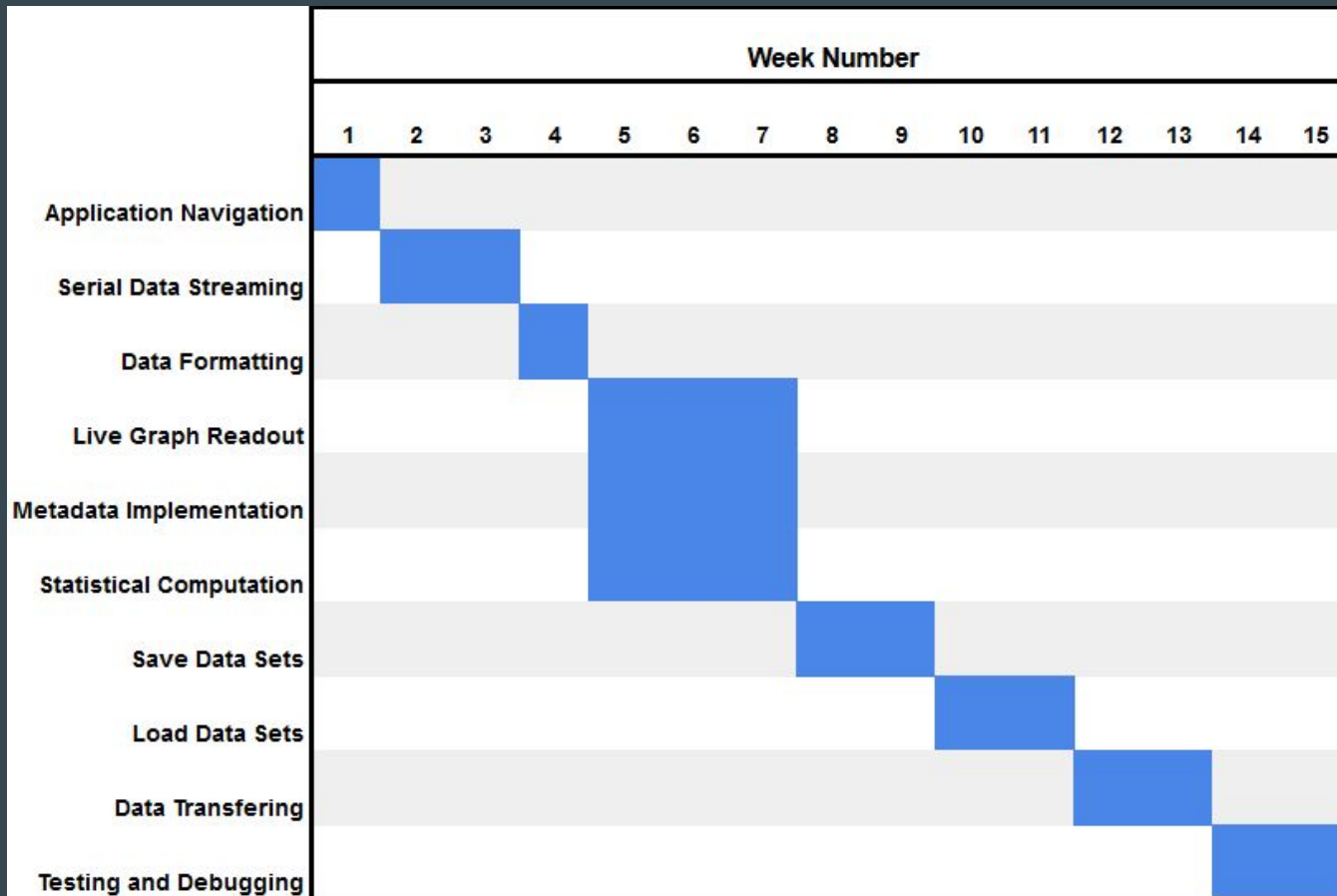- Well documented
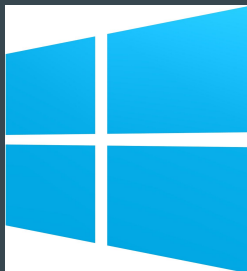
- Apache Open-Source 2.0 License

Potential Risks

- Unable to create real-time display of the data stream

- Poor user interface

- Issues with hardware working properly

Schedule

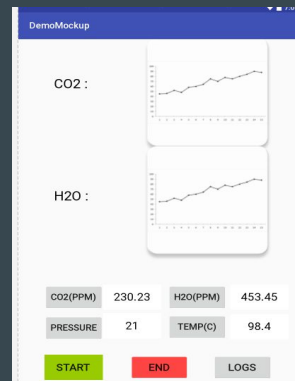|	Week Number														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Application Navigation	■														
Serial Data Streaming		■	■												
Data Formatting				■											
Live Graph Readout					■	■	■								
Metadata Implementation					■	■	■								
Statistical Computation					■	■	■								
Save Data Sets								■	■						
Load Data Sets										■	■				
Data Transfering												■	■		
Testing and Debugging														■	■

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Conclusion

- Android tablet application
- Used for ecological research
- Replacing the old system
  - Windows laptop
  - Bulky
  - Slow
- New, more feature rich system
  - Live data reporting
  - Statistical computation
  - Portable Android device

Questions?

CO₂ SOFTWARE

Contact Information
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