Group number: 19
Project title: Portable Nutrient Data Collection System - Phase II
Client &/Advisor: Dr. Qiao & Dr. Qeu

Team Members/Role:
Ben Theisen - Group Leader
Michael Rupert - Webmaster
Zakk Belloma - Key Concept Holder
Ben Engebrecht - Communication Leader
Logan Boas - Communication Leader #2
Ryan Young - Key Concept Holder #2

o Weekly Summary

This past week was spent working on the design document, serial communication from the spectrometer, and further development of the app with bluetooth communication. The design document has been split into parts so that each sub group can write about their part. The serial communication has proven to be more challenging than expected. Further testing is required and the group has diverted more attention to that aspect of the project. The app has continued progress, beginning to set up pages of the app for the local database, and control of the spectrometer. Also, bluetooth communication is still in progress.

o Past week accomplishments

- ❖ Implemented Firebase into the app. Capable of using it, but does not have full functionality yet.
- ❖ Updated app to support Bluetooth module communication between the Raspberry Pi and the Android device, this will allow for control of the spectrometer through the app.
- ❖ Progressing on getting the android app to pair to the HC-06 module.
- ❖ Designed an interface between spectrometer and PC for testing purposes,ested serial code on Raspberry Pi
- ❖ Finalized circuit design and priced circuit components.
- ❖ Put together breakout board. Tested breakout board with spectrometer, discovered that the pins were mislabeled.

o Individual contributions

NAME	Individual Contributions	Hours this week	HOURS cumulative
Michael Rupert	Tested creation of dummy data in Firebase. Further experimentation with serial communication with spectrometer.	5	35
Ben Theisen	Worked heavily on the design document. Implemented Firebase into the app and began to program spectrometer control into the app.	6	38
Zakk Belloma	Implementing bluetooth client capability in the app to allow for the transfer of data.	5	35
Ben Engebrecht	Assembled Raspberry Pi, attempted to read data from spectrometer	5	35
Logan Boas	Finalized the voltage booster circuit design. Priced and compared circuit components for voltage booster. Worked on design document.	6	35
Ryan Young	Tested RS232 communication on spectrometer. Design Document Work.	5	40

o Comments and extended discussion
- Our Team is working more with the spectrometer as it is our highest priority at this point.

o Plan for coming week
- Meet with advisor on Thursday -All
- Finish Design Document - All
- Further experimentation with bluetooth and android app -Zakk, Ben T
- Implement sending commands to the spectrometer through Bluetooth - Zakk, Ben T
- Research how sending data to the cloud with Firebase works and how to deal with that data afterwards - Ben T

- Work on developing a system for extracting data from the spectrometer and analyzing it - Ben E, Ryan, Michael
- Order the needed parts for the step up voltage converter - Logan B

What we learned this week

❖ Found the wavelength and typical intensity of nitrate in a spectrometer graph which will help with what data we collect from the spectrometer - all

❖ Learned spectrometer commands to program into the Bluetooth capability of the app for spectrometer control - Ben T

❖ The company that designed our spectrometer mislabeled the pins on the breakout board, so we learned to count the pins instead of assuming that the silkscreen on the board is correct-Ben E, Ryan

❖ We learned that the voltage booster's transistor could be switched on and off by using a Pulse Width Modulation (PWM) from the raspberry pi. - Logan

Summary of weekly advisor meeting (if applicable/optional)

Reviewed data from Shenmin (grad student working with the project) surrounding the analysis of the chemicals. Currently, a lot of sodium is being detected in the samples which is not what the project is looking for. So, we looked through a research paper to find where nitrate is typically found on a spectrometer graph. In doing so we are able to focus our data collection from the spectrometer. Knowing this we can begin to implement this focus into our serial communication and control of the spectrometer. Discussed parts on order, as well as more specification for the voltage booster compared to the current equipment being used.