

EE / CprE / SE 491 Weekly Report 3

Feb 14 - Feb 20

sddec24-16

Designing a Smart Plant Nurturing System Enabled by IoT Technology

Faculty Advisor / Client: Md Maruf Ahamed

Team Members:

- Tejal Devshetwar - Frontend / Backend
- Holden Brown - Frontend / Backend
- Blake Hardy - HW / SW Integration
- Cameron Jones - HW / SW Integration
- Cayden Kelley - PCB Design
- Chase O'Connell - PCB Design

Weekly Summary:

This week, we worked hard to get parts selected and ordered. The group did individual research and met on Monday to put together the order for ETG. Unfortunately, when we got together, more questions were raised about the amount of RAM necessary for the Raspberry Pi, and we discovered multiple websites selling the same NPK sensor with incomplete data sheets. Due to this and the cost of these devices, we decided to hold off on placing the order pending further research. Although we did not meet our initial goal, we did discover that an Arduino offers way more functionality than initially realized and offers some interesting functionality through the Arduino cloud. We also discovered that we could check out Raspberry Pis and Arduinos from ETG, which will be very beneficial with our limited budget. Besides sensor and compute device research, some further decisions have been made by the software team regarding the smartphone app, and we met with our faculty advisor/client to catch him up on our progress and get further questions answered.

Past Week Accomplishments:

- UI decisions have been made to better focus on our target audience
 - The language to build UI has been decided as React Native
- Met with advisor Maruf to determine our budget, first components, and general scope of our project.
 - Leaning towards a RasPi 4 4GB and NPK sensor after this meeting
 - Our budget is \$250 as of now, could possibly go up
 - Wants us to make the app publicly available on the app store
 - Cost of \$100 for Apple app store
- Made an Excel sheet to store parts for our project with links and part names
- RasPi 4 - All
 - More user-friendly offering an easy-to-work-with OS
 - Easy to work with languages are supported like python

- Group member experience says we need one with more than 1 GB of RAM, but further research is needed for a definitive decision.
- Still looking into the power supply
- Still need a specific place to buy it from
- Arduino
 - Discovered an Arduino is more capable than originally thought
 - Has Wi-Fi and Bluetooth capabilities and also access to the Arduino cloud, which could be huge when integrating with an app
 - Interfaces well with a breadboard, making rapid prototyping much easier
 - Very similar to a Raspberry Pi
- Soil moisture sensor
 - Decided this is the first sensor to implement
 - Work out the kinks of getting the Pi working with the server and sensor
- NPK sensor
 - Discovered some discrepancies with the data sheet. Need to double-check and be sure we have access to an in-depth data sheet before committing to the NPK sensor we have found on Amazon.
- Set a goal to order a plant pot and soil through ETG for testing our sensor, Pi, and connections between them, such as the server.

Plans for Coming Week + Action Items:

- Holden Brown - help with determining sensors to use for the first model. Work on UI more and make adjustments for incorporating the sensors we are getting in the next few weeks.
- Tejal Devshetwar - Research on if we need to get a server and how to use it. Check if we can use the ISU server to work with. Decide the costs that would add on. Start setting up a basic React app and keep working over the weeks.
- Blake Hardy - finalize sensor choice the NPK we were looking at is not going to work, look into arduino cloud more, might actually flip on decision to use PI. Need to get parts ordered and actually start working asap but with this budget we can't afford to change our minds
- Cameron Jones - Investigate arduino cloud and other server hosting options. Study up more on spring boot, communicate with team members and attempt to finalize sensor choices.
- Cayden Kelley - With the rough outline of the parts chosen, I will be putting together a document outlining the power requirements of each sensor along with the data connection requirements. This will allow us to be sure that whatever computing device we choose has enough ports and we choose a large enough power supply for all of our devices/sensors. I will also be looking further into the Arduino cloud as I'm putting together this document to see how the cloud and the Arduino will work together to meet our needs.

- Chase O'Connell - Check out an Arduino from ETG if versions with Wifi modules are in stock. Research cheap soil, plant pots, and seeds to begin creating a test setup for our device. Continue research on sensors as well as watering actuators.

Pending Issues:

- Tejal Devshetwar
 - No issues
- Holden Brown
 - No issues here.
- Blake Hardy
 - No issues
- Cameron Jones
 - No issues
- Cayden Kelley
 - No issues
- Chase O'Connell
 - No issues

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Tejal Devshetwar	Brainstorming on using React native and watching a few tutorials on how to use it.	3	5
Holden Brown	Front end design and sketching in figma. Making design decision for the app such as a calendar for selecting what days data to view. Reminder system. Brainstorming on more app ideas and how to make the UI more user friendly.	3	16
Blake Hardy	Made parts spreadsheet, reviewed some raspberry pi tutorials for working with the embedded side of them, looking into possibly using arduino cloud which could greatly simplify this entire project	9	12
Cameron Jones	Continued sensor research along with research about connection protocols. Communicated with advisor about budget and future plans.	3	5
Cayden Kelley	Continued sensor and compute device research. Briefly looked into Arduinos and the	3	8

	Arduino cloud. Has many potential upsides but has additional costs that needs to be looked into.		
Chase O'Connell	Communicated with advisor and took meeting notes. Checked out Rasberry Pi 3 16GB from ETG and identified potential Arduinos to check out. Continued sensor research.	4	9