EE / CprE / SE 492 Weekly Report
November 1 - November 14, 2024
sddec24-16
Designing a Smart Plant Nurturing System Enabled by IoT Technology
Faculty Advisor / Client: Md Maruf Ahamed

Team Members:

- Tejal Devshetwar - Frontend
- Holden Brown - Frontend/backend
- Blake Hardy - Backend
- Cameron Jones - Backend
- Cayden Kelley - Hardware
- Chase O'Connell - Hardware

Summary of Work:

Throughout the past week, we have primarily focused on resolving technical issues within our existing setup. For the embedded side of the project, our team is continuing to focus on both communication with the database through HTTP, POST, and GET requests, as well as integration with our new PAR light sensor. As both the PAR sensor and new NPK sensor use the RS485 communication protocol, the setup should be relatively straightforward by daisy-chaining the devices together and just accessing them through their different internal IDs. In terms of the backend, there have been endpoint adjustments to ensure the data being received from our selected sensors will be able to be displayed correctly.

We have also completed the PCB layout for the power board we will be using with our device, however we still have a list of changes to make for a new revision of the board to be fully compatible with all peripherals. With our limited time left, we are planning to keep the components easy to solder by hand and reduce the number of board layers to speed up the fabrication process.

Work Period Accomplishments:

- Made progress with getting HTTP requests working specifically getting a working GET request and a semi functional POST request
- Completed the PCB layout initial design. Identified changes to make for final design:
    - Additional screw terminals for 2-relay unit
    - GND-layer (either bottom for a 2-layer or inner 2 layers for a 4-layer board)
    - Change SMD resistor physical sizes to be larger than 0402 so they are easier to solder by hand.
    - Ensure all connectors are labeled and at the edge of the PCB.
- Created ETG order form for many of the final hardware components to use in our device.
- Database endpoint adjustments to accommodate real sensor data

Plans for Coming Week + Action Items:

- Tejal Devshetwar - —
- Holden Brown - Meet on Saturday to work as a team in the TLA. Investigate and fix bugs between the back and front end. Be on stand-by to help other group members with frontend/backend questions.
- Blake Hardy - Integrate new sensors and program their IDs, refactor the arduino code to make it not awful.
- Cameron Jones - Work on getting par sensor to work alongside new NPK sensor + try and get the POST request to actually have data in its body
- Cayden Kelley - Meet on Saturday to work as a team in the TLA. Get sensor data from all sensors and read into the app. Begin gathering soil data from our sensor suit and experiment with different watering/fertilizing options. Research and order case.
- Chase O'Connell - Submit BOM and Gerber files of PCB to JLCPCB through ETG for circuit fabrication, including revisions from the first design.

Pending Issues:

- Tejal Devshetwar
    - No issues
- Holden Brown
    - No issues
- Blake Hardy
    - Sending http requests line by line is driving me insane
- Cameron Jones
    - No issues.
- Cayden Kelley
    - No issues
- Chase O'Connell
    - Uncertainty about 2-layer vs. 4-layer PCB setup. Will research more on the best way to approach power board stack and layout.

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Tejal Devshetwar	—	—	28.5

Holden Brown	Worked alongside the CPRE team to handle round-trip data.	2	54 .9
Blake Hardy	GET and POST requests now work. FINALLY.	10	61
Cameron Jones	Helped get the get/post request working	4	47.6
Cayden Kelley	Tested the newly acquired pumps, solenoid valve, and relays to verify they would work properly with our intended watering system. Worked to get data off of the new NPK sensor. Put together an order for ETG for the parts that I had acquired and tested of my own. Began looking into case options.	8	71.6
Chase O'Connell	Completed revision 1 of layout for the power PCB. Identified changes for revision 2 and began implementing changes.	4	49