

EE / CprE / SE 491 Weekly Report 2

Feb 6 - Feb 12

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:

In the past week, our team developed a good understanding of what types of sensors would be best for our project and the feasibility of implementing each type. The software team developed a UI draft for the app and conducted some initial plant research that would be helpful for our project. The PCB team determined that a Raspberry Pi would be the best selection for a prototype as it includes a WiFi module, I/O, and processor that would be able to handle what is needed for the project. Within our meeting for the week, we made a plan to meet with ETG to ask some questions about the logistics of ordering parts and which vendors are acceptable. Going forward, we need a clear budget and plan for initial hardware to order as soon as possible.

Past Week Accomplishments:

- Created a mockup for the frontend of the app - Tejal + Holden
 - Draft for login page, information to be displayed on a selected plant, and general formatting of info.
 - Initial feature ideas: user account, names / labels for plants, local weather, graph of plant health over time, plant data such as temperature, soil pH, etc., plant summaries, explanations of collected data, and tips for plant care.
- Researched existing apps / software for plant care. - Holden
 - Found a similar product to what we are trying to make:
<https://www.lawntractorco.com/pages/smart-plant-monitor-soil-moisture-light-nutrient-meter>
- Researched potential sensors. - Cayden + Chase + Cameron + Holden + Blake
 - Determined that an NPK (nitrogen, phosphorus, potassium) sensor will likely be essential for our project in terms of soil nutrient detection.

- Found a potential option that includes multiple other features that would also be very helpful to our project:
<https://www.amazon.com/Taidacent-Detector-Agricultural-Phosphorus-Potassium/dp/B08MXXSP59?source=ps-sl-shoppingads-lpcontext&ref=fplfs&pvc=1&smid=A18RFE6ZVD9PX6>
- Discovered that using a light sensor that measures PAR (photosynthetically active radiation) wavelengths of 400nm-700nm would be the most important for plant care.

Plans for Coming Week + Action Items:

- Holden Brown - User interface designing, sensor and plant research with the goal of understanding our sensors data in the scope of plant health.
- Tejal Devshetwar - Researching on the different ways to implement the app, user interface designing and making a list of available resources to get started on the app.
- Blake Hardy - Finalize sensor choices and standards to use. Likely I2C for environment and modbus for NPK sensor.
- Cameron Jones - Research sensors, refresh knowledge on backend code, research actuators
- Cayden Kelley - Plan to continue researching potential sensor options with the goal of coming to a decision with the group by the next regularly scheduled group meeting. Would like to begin researching actuators for fertilizer applications to ensure the microcontroller has the capability to handle all of the connected devices.
- Chase O'Connell - Continue to research and document potential sensors and actuators. Using the project budget and ETG to determine cost limitations, help develop a final list of components to order by 2/19.

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 | Researching about different platforms or languages that can be used to develop an app for ios and android. Researching sources that provide tutorials to get started with React Native. Front-end user interface brainstorming and designing. | 3 | 5 |
| Holden Brown | Front end user interface development and brainstorming, sensor research about which sensors are important for plant health and what metrics are best for those sensors. For example, I found information for light sensors that 400nm to 700nm wavelength is best because that is used for photosynthesis. | 11 | 13 |
| Blake Hardy | Sensor research, was sick, didn't accomplish much | 1 | 3 |
| Cameron Jones | Researched potential sensors | 3 | 5 |
| Cayden Kelley | Researched potential sensors and began looking at microcontroller options. Discussed PCB requirements and potential stretch goals for a fully custom PCB with Chase | 3 | 5 |
| Chase O'Connell | Brainstormed potential PCB implementations for this project with Cayden. Determined some power and component selection considerations. | 3 | 5 |