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Internet of Things

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Final Project Proposal

For our final project, we plan to create a plant, or if assembled in an array garden, monitor. For this monitor, we will use a photoresistor to monitor sunlight received by the plant to guarantee enough UV light is received by the plant (ideally, we would use a UV detector). We will also use a temperature and humidity sensor to make sure the plant is kept at a livable temperature as well as placed in the perfect humidity. The most important sensor that we will be using is a soil moisture sensor, this sensor detects the moisture in the soil itself and can tell the user when the plant needs to be watered so that they are kept quenched and do not wilt. The controller that will do all of the processing for our IoT device will be a Raspberry Pi 4. We will likely use the CoAP protocol to transit our data over the internet to be viewed on any web browser the user would like.

Specifically, the sensors we will be using is as listed below:

- A normal run-of-the-mill photoresistor.
- The HW-080 soil moisture sensor.
- DHT11 Temperature/Humidity sensor.
- Possibly an auxiliary temperature sensor for temperature gradient/confirmation.

These sensors are owned by Caleb and will make the perfect plant monitor.

There is a small possibility that the Raspberry Pi version that we use could shift. Some other possibilities are the 2B+, 3, or the Zero W. There is another possibility that we will need to use a normal analog to digital converter to get the values needed for the photoresistor/moisture sensors in order to be read properly by the Raspberry Pi (we may also use an Arduino Nano to

accomplish this).

There is some concern about the controller getting wet since it will need to be close to the plant(s) and has the potential to either get rained on or accidentally watered along with the plant(s). Keeping the device powered is another concern as well. If we require a wall plug, the plot will need to be in range of an outlet. Alternatively, if we use a battery bank of some kind, we will have to worry about the device potentially running out of power after some time. If we had more time. We could consider expanding the project to automatically water the plant(s) as well as monitor them to cut out human intervention entirely. This, however, we will not be exploring since it adds many more risks and factors that would need to be considered.

Overall, we believe that a plant monitoring device fulfills the requirements of the project without being too complex to be accomplished in the time remaining in the semester. Depending on how the final product fairs, it may become something that is used permanently that we will want to continue developing after our time in CSCI 433 ends.

References

Photoresistor: Resistor types: Resistor guide. EEPower. (n.d.). Retrieved November 15, 2021, from https://eepower.com/resistor-guide/resistor-types/photo-resistor/#.

Dht11–temperature and humidity sensor. Components101. (n.d.). Retrieved November 15, 2021, from https://components101.com/sensors/dht11-temperature-sensor.

Alldatasheet.com. (n.d.). *HW-080080-10-9*. ALLDATASHEET. Retrieved November 15, 2021, from https://pdf1.alldatasheet.com/datasheet-pdf/view/458562/MACOM/HW-080080-10-9.html.