EE/CprE/SE 492 WEEKLY REPORT 6

3/29 - 4/12

Group number: 11

Project title: Smart Water Leak Shutoff Valve

Client &/Advisor: Cheng Huang

Team Members/Role: Matthew Brandt, Curt Kissel, Cody Juracek, Wolfgang Morton, Grace Wilkins

- Weekly Summary –
    - Hardware Team - We ran several tests with the software team by attempting to connect the device with the backend, however, we ran into a few issues. We suspect connecting via VPN and hotspot are the main issues. This Tuesday, we are going to attempt connecting via router (the standard for most). Additionally, we are testing to see if the device can function completely from the WiFi module, while the Arduino is free for use to store more memory while the device is disconnected from the WiFi. Aside from WiFi issues, our prototype is going very smoothly. With the device's BJT replaced with a relay, the solenoid is able to flip between states. The reason we made this switch is to combat the BJT's overheating issue, especially since it would have been enclosed in a sealed container which would have overheated other components. We also tested the flow sensor and noticed we need to calibrate it to combat it's 20% inaccuracy. We also mapped out how the secondary power source will be implemented, which it will tested and implemented this Tuesday. In short, our circuit is complete, we are just adding improvements to make it more efficient and decrease cost.
    - Software Team - We worked on getting the line graphs to display the daily, weekly, and monthly usage of water detected by the flow sensor. Coded the ESP to set up a webpage to enter the device information to connect to the wifi and the application. Wrote code for the ESP to retrieve a schedule every hour, update the mode of the device, etc. Worked on writing the interrupts for the flow sensor to open and close the solenoid.

- Past Week Accomplishments
    - Matthew – Wrote ESP code to get a schedule for the device to follow and update its mode. It can automatically connect to wifi and remember the device name through power loss. The ESP can post water usage data to the website. Wrote methods to retrieve water usage data to display in a line graph on the application.
    - Cody – Worked with Wolfgang in developing a working circuit theory on how to implement a secondary power source.
    - Curt – Worked with Matt to allow users to establish connection to their device within the app. Retrieve water usage data and display them in a line graph. Minor bug fixes.
    - Wolfgang – FInished up alterations to the housing unit. Worked with Cody to determine a working battery backup. Worked with Grace and Cody to alter the

circuit design from BJT to Relay and tested the new design. Performed first round of accuracy testing for the flow sensor.
    - Grace – Developed and tested a new circuit that incorporates a relay instead of a BJT with Cody and Wolfgang. Developed methods for testing accuracy of flow sensor. Began flow sensor testing.
- Pending issues
    - Need correct syntax for interrupts for ESP to open/close solenoid
- Individual Contributions

Name	Contributions	Hours this Week	Cumulative Hours
Matthew	ESP code and backend development	20	71
Curt	Frontend development	17	70
Cody	Developed a circuit on how to implement a secondary power source. Tested hardware as well as flow sensor calibration.	20	79
Wolfgang	Housing and circuit design. Secondary Power implementation and accuracy testing	22	73
Grace	Circuit design and testing	18	69

- Plans for upcoming week
    - Matthew – Finalize code for ESP and add any final methods that Curt would need for the mobile app.
    - Curt – Testing for statistics page as well as device connection. User interface improvements.
    - Cody – Calibrating flow sensor. Implementing a secondary power source.
    - Wolfgang – Solder the components for our circuit and coordinate with Grace and Cody on finalizing the accuracy of the flow sensor.
    - Grace – Coordinate with Matt to finish code for ESP specifically anything relating to the solenoid sensor. Determine if we are able to fully remove the arduino nano from the system. Finish accuracy testing and document data.