

EE/CprE/SE 492 WEEKLY REPORT 5

3-16 - 3/29

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 have just about every component functioning: the solenoid closes at will and by user input and the flow sensor is able to read data while integrated to a plumbing system. The wifi module is able to transmit dummy data between the device and the http backend website, we want to transmit real time data from the flow sensor through the transceiver to the backend and frontend's user interface. During one of our tests, we noticed a transistor heating up and found that our voltage supply produces about 300mA of extra current. We are currently exploring to see if that current supplement is the root issue. We are also exploring other options to use other than our MJE 180 BJT; we are meeting with our project advisor to help generate ideas. We are determining what would be the best way to incorporate a secondary power source.
 - Software Team - A new screen has been created within the Android application that allows the user to create a new event. Each event will specify a time in which the user does not expect water usage (for example, when they are asleep or at work). Created text alerts for when the device is automatically turned off. Configured the back end to run with https to encrypt communication for security purposes. Planned a scheduler for the device to use to automatically monitor water usage. Created more backend methods to handle sending a schedule to the wifi module. Worked on writing the code for the wifi module to send data to the application. Created a web page for users to enter their wifi information for the wifi module. For hardware, we asked ourselves a what-if scenario when either the internet or power goes down while the shutoff valve is in operation. We started looking into a secondary power source lasting for at least four hours; afterall, the consumer would still have running water. The goal is to have the device operate and be controlled manually for either scenario.
- Past Week Accomplishments
 - Matthew – Created new methods to send schedule to wifi module. Allowed app to work with both http and https. Worked on wifi module code to send water data to spring application
 - Curt – Completion of the event scheduler. Now allows users to add and delete events. Events can be one time, daily, or weekly. Event information is stored and modified on the backend based upon user instructions. Worked with Matt to integrate backend scheduling methods.
 - Cody – Determined which secondary power source is required. Created a PCB layout and circuit schematic for the device.

- Wolfgang – Set up and proceeded with the initial testing phase of all components in tandem. Discovered new issues with one of our circuit components and began troubleshooting. Also, mapped out the circuit plan for our board and considering PCB options.
- Grace – Determined how to operate the new wifi module and continued to develop code. Created test programs for the solenoid and water flow sensor.
- Pending issues
 - Wifi module works better with http, so some data may not be encrypted
 - Adding a secondary power source will greatly increase the cost of the product by \$40-70. Something to consider, originally we had a target cost of \$250 - we pushed this cost down to \$150 after we initially started building the circuit. The product should not be more than \$200.
 - Size of memory on arduino may not be big enough
 - The BJT is currently getting hot, we think is because of an excessive current flow. We will be further investigating this and meeting with our project advisor to generate some ideas. We are currently looking into other transistor options or mitigating some of the excess current.
- Individual Contributions

Name	Contributions	Hours this Week	Cumulative Hours
Matthew	Back end development, connection between wifi module and app	15	51
Curt	Frontend development	13	53
Cody	Created a PCB and circuit schematic for the device. Assisted with testing developed troubleshooting methods. Determined a secondary power source.	19	59
Wolfgang	Full component testing, circuit mapping and troubleshooting	14	51
Grace	Connection between wifi module and arduino and other components. Modified test programs.	15	51

- Plans for upcoming week
 - Matthew – Create webpage for users to enter wifi information for wifi module. Write the code for the wifi module to act as a finite state machine. Test wifi module code
 - Curt – Completion of settings page. Work with Matthew to connect the wifi module to the software.
 - Cody – Finish troubleshooting circuit. Finalize PCB and circuit schematic, and secondary battery implementation.
 - Wolfgang – Solder components for our potential final circuit. Finish troubleshooting of circuit issues and assist Cody with battery backup planning.
 - Grace – Continue working on Arduino coding, determine if other memory is necessary, and what other components may be needed if wifi connection is lost or power is lost.