

EE/CprE/SE 491 Weekly Status Report 9

Dates: 3/26/18 – 3/30/18

Group #: 5

Project: Micro-Electro-Mechanical Systems (MEMS) Based Sensing System for Soil Conditions Monitoring

Client: Dr. Halil Ceylan

Advisor(s): Shuo Yang and Dr. Yang Zhang

Team Members:

Nathan Coonrod (Report Manager)

Kyle Kehoe (Communications Manager)

Jacob Verheyen (Meeting Facilitator)

David Severson (Web Master)

Sok-Yan Poon (Timeline Manager)

Weekly Summary

Our team has continued hardware and software development for the project. Specifically, our project team has simulated a design for the capacitance measurement circuit and will order parts to implement a prototype soon. We have also continued writing Arduino code to datalog resistance measurements from two channels to an SD card and will also do so for the two capacitance measurement channels as well.

Past Week Accomplishments

- Kyle: Worked on developing Arduino code to implement resistance measurement channels. Also, researched Arduino interrupts.
- Nathan: Further development of analog front end for capacitance measurement.
- Jacob: Successfully got two resistance measurement channels working on the prototype. Started researching hardware interrupts on the Arduino so we don't have to keep it on during the time between temperature/moisture content measurements.
- David: Began PCB schematic for capacitance measurement. Began creating BOM components for capacitance measurement. Picked components for circuit and modeling on breadboard.
- Sok-Yan: Working on Arduino code to read the measurement of resistance.

Pending Issues

We are still in the process of coordinating the MEMS sensors re-fabrication. Realistically, we will not be able to implement the MEMS sensors with our data acquisition system this semester due to time constraints. We will plan on implementing them into our design next semester during EE 492.

Individual Contributions

| Name | Contribution | Hours This Week | Hours Cumulative |
|-------------|---|------------------------|-------------------------|
| Kyle | Worked on developing Arduino code to implement resistance measurement channels. Also, researched Arduino interrupts. | 3 | 34 |
| Nathan | Analog front end for capacitance measurement | 3 | 33 |
| Jacob | Successfully got two resistance measurement channels working on the prototype. Started researching hardware interrupts on the Arduino so we don't have to keep it on during the time between temperature/moisture content measurements. | 3 | 31 |
| David | Continued work on measurement circuits. Began creating PCB for our first prototype, will be ordered 4/4 or 4/5 | 4 | 35 |
| Sok-Yan | Working on Arduino code to read the measurement of resistance. | 3 | 34 |

Plan for Coming Week (4/2/18 – 4/6/18)

We plan on continuing hardware and software development. This includes designing a board using Eagle for our prototype data acquisition system that can implement both the capacitance and resistance measurement circuitry for moisture and temperature measurements respectively. We will also be writing Arduino code that can neatly log the data collected to an SD card on a .txt file and can then be imported to Excel using a CSV delimiter method.