EE / CprE / SE 491 – sddec19-19
Printed Miniature Nutrient Sensors
Weekly Report 9

4/22/19 - 4/26/19
Client : Dr. Liang Dong
Faculty Advisor : Dr. Liang Dong

Team Members

Jonathan Hugen - Manufacturing and Testing
Samuel Keely - Software and App Development
Jeremy-Min-Yih Chee - Software and App Development
Clayton Flynn - Manufacturing and Testing
Ritika Chakravarty - Circuit Design

Weekly Advisor Meeting 4/24/19

Due to Dr. Dong's schedule, we communicated via email. We discussed a few questions that we thought might be asked during our final presentation. We also thanked him for working with us this semester.

Weekly Group Meeting 4/23/19

This week in our meeting we changed our regular meeting time and place and met in the 491 classroom. We discussed what we needed to know from Dr. Dong to continue making progress on our individual projects. We also discussed our grade on the Design Document and we tried to draw comparisons to the Project Plan. We did well on the Design Document and we did poorly on the Project Plan, so we discussed ways of incorporating pieces of the Design Document into the Project Plan and discussed the areas where we still needed great improvement.

Past Week Accomplishments

Jonathan Hugen:

- Met with Yun cong who is my advising TA
- Stayed in communication with Dr. Dong about another batch of ISM for testing
    - Started working with old prototypes to learn more about the current manufacturing problems.
- Finished project plan and discussed changes to make to design document
- Discussed our roles in the presentation
    - Split up slides for each person to do
    - Agreed on how much time each person would talk
    - Set up final meeting before final presentation

Samuel Keely:

- Application Optimization
- Server design work
- Verification of code used for Arduino system

Jeremy-Min-Yih Chee:

- Attended weekly meetings

- Met with Xinran to discuss about the cellular module that will be implemented into the microcontroller.
- Worked on Project Plan.

Clayton Flynn:
- Attended weekly meetings
- Worked on Design Project
- Discussed roles for the presentation
- Started on slides for the panel presentation

Ritika Chakravarty:
- Worked on Project Plan.
- Met with Xinran to understand how the fluctuations output voltage would be minimized during data collection.

Pending Issues

We are still waiting to gain access to the greenhouses North of the ISU campus. Our sensors will be tested in the greenhouse. We should be setting up a short tour of the lab in the following weeks. Email communication from now on must be more structured and thought out to include all the relevant parties when discussing a problem, or discussing project details. We are starting to accumulate some communication errors that drastically affect the responsibilities expected of us. We are getting two sets of conflicting information from the grad students and Dr. Dong and we need a system to eliminate confusion. At the moment we are still waiting for the chemicals to make another batch of ISM (ion selective membrane) for testing. Without ISM, the testing that requires ISM is at a standstill. The image shown on the right is the only ISM that we left and the batch is too viscous to be able to print. The cost of the material would be equivalent to around $300-400 for a vial that size.

Individual Contributions

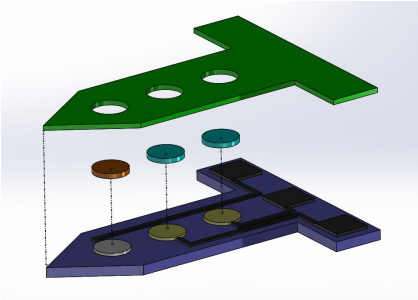
Member	Projects	Hours	Total Hours
Jonathan Hugen	- Discuss strengths and weaknesses in Project Plan - Discuss what we need to change for final Project Plan - Met with grad students for more project details - Practice dispensing fluid on silicon wafer sensors - Practice dispensing fluid on PCB sensors - Practice machine calibration - Learn how to scale and rotate programs - Learn some simple problem troubleshooting for dispensing robot	1	20
Samuel Keely	- Develop Server prototypes - Get Prev. server revisions running for summer testing - Discussed questions to ask Dr. Dong	2	15

Jeremy-Min-Yih Chee	- Attended weekly team meetings. - Worked on Project Plan - Research on source code cellular module - Worked on presentation slides	3	23
Clayton Flynn	- Attended weekly meetings - Worked on Design Project - Discussed roles for the presentation - Started on slides for the panel presentation	2	16
Ritika Chakravarty	- Worked on Project Plan. - Understood how the digital filters in the Arduino work to filter out fluctuations in output voltage values. These values are collected everyday and compared to the calibrated Voltage vs. ppm curve, to test the accuracy of the sensors.	3	22

Plans For Upcoming Week

Jonathan Hugen

- Practice for our final presentation
    - Ask questions to the group members that will likely be asked during the presentation
    - Practice achieving ~4 minutes of speaking time each.
- Write a program for the fluid dispensing robot to coat the top of the silicon sensor with epoxy (shown in green) and the gold pads with ISM (shown as light blue dots).



Samuel Keely

- Server SQL foundation
-Arduino code check
-Application design

Jeremy-Min-Yih Chee

- Continue optimizing the provided source code in terms of stability.
- Continue calibrating the interval where the app will refresh and retrieve the data information from the sensor.
- Work on final presentation.
- Work on design document

Clayton Flynn

- Works on panel presentation slides

- Work on updating the design doc for the final submission
- continue working with the fluid dispenser

Ritika Chakravarty
- Work on final presentation.
- Work on final Design Document.
-Discuss goals for circuit design with Dr. Dong for next semester.

Future Plans

We will soon be gaining access to the lab and greenhouse to test our sensors. We will also have to establish a better communication system to eliminate any possibilities of miscommunication between our team, the graduate students and Dr. Dong. Apart from that, we will continue working on our individual goals for next week.