CPSC 495 – Project Report

# Introduction

For CPSC 495 I did my project on indoor precision farming. Indoor precision farming is a type of indoor farming where all aspects of the growing climate are controlled. Some examples of these conditions from this project are: temperature, light, CO2 concentration and, fluid pH. To control all of these climate conditions many different sensors are required for detection and many different devices are required to actually modify the environment. The software to interface with all of these sensors and devices must also have quite a few different pieces. MIT’s Open Agriculture team has already started the software for a basic indoor precision farming system.

# Implementation and Challenges

Work on this project started off slowly. It took a couple weeks to figure out all the pieces I needed and what was missing from the original purchase. In the meantime I began tinkering with Open Agriculture’s software. This software proved to be complicated and difficult to use. It showed signs of many poor design decisions. Due to its difficulty and my lack of progress I moved on to building the electronics circuits that I had the pieces for such as the electrical outlet box. Progress building the circuits went well, other than some tasks such as soldering taking me quite some time as I was just learning how to perform these tasks for the first time. After finishing these tasks I began working on the software once again. At this point the software became the main challenge for the entire project. There was a lack of documentation on how to use the software and how to modify the software. This combined with having different sensors than the ones the software was designed to work with led me to create my own software. Within a matter of days I was able to retrieve data from all of the sensors with my new software. After its initial creation I kept improving the software to make it easier to use with the goal of feature parity to Open Agriculture’s software in the not too distant future. During this same time I was refining my wiring to make it simpler and more permanent. After finishing my wiring I began to mount the electronics on the box with screws for presentation day.

# Conclusion and Future

This project has been a good experience at introducing me to the practical applications of hardware systems. I have learned how to implement a reactive system as well as the challenges of building a system using other’s beta software. Throughout the semester I kept a project journal to document my progress on this project. In preparation for handing over this project to another person I have started working on a wiki and have created a transition document to minimize the startup time of whoever works on this project next.