

Problem and Users

sdmay25-04

Ashley Falcon, Henry Hingst, Wesley Smith,
Yok Quan Ong, Drew Scheidler, Hector Perez Prieto

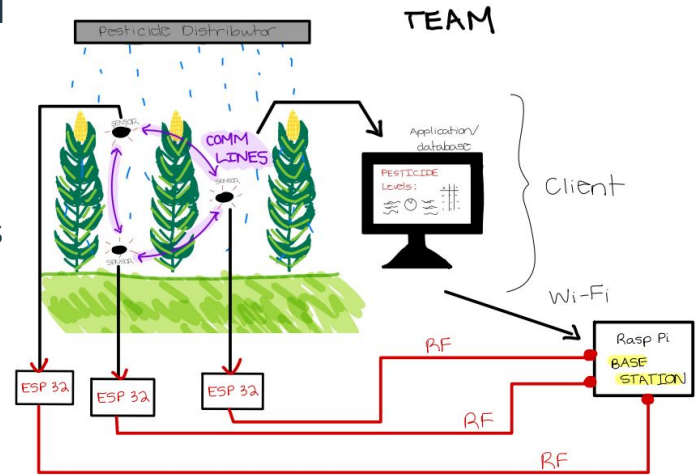
Advisor: Nathan Neihart

Client: Claussen Labs

Project Overview

Goal: Wireless Mesh Network for Pesticide Spray Monitoring and Mapping

- Collect resistance data from IDEs (Interdigitated Electrodes) at various levels of crop canopy
- ESP32s microcontrollers will also be placed at various levels of corn canopies and locations and create a “mesh network”
- Measurements will be sent to a centralized device to be pulled by user
 - Centralized device will be a Raspberry Pi
 - Transmitted over bluetooth or wifi
 - Text files must be user friendly



Problem Statement

Context:

- World population and food demand is ever-growing
- Proper distribution of pesticides is essential to maintaining and improving crop yields

Our solution:

- Collect data to reveal most effective pesticide distribution method
 - Drone spray, boom spray, airplanes, etc.
- Measurements will be far easier to collect and interpret



Persona 1 (Claussen Lab Personnel)

- Nathan Jared
 - Developing sensors to measure pesticide spray
 - Looking for a way to accurately measure the distribution of pesticide
 - Plans to use our project in future testing and development of his sensors



Persona 2 (Engineering Students)

- Griffin Ellis
 - Has previously worked to develop an initial prototype of our project
 - Is having trouble getting accurate readings from sensors and system
 - Will be involved in the future testing of our project



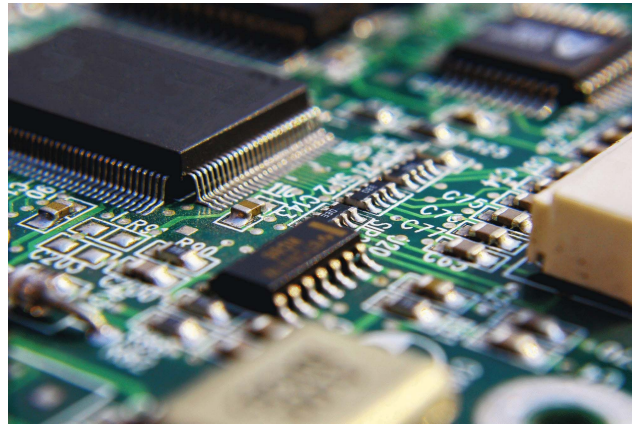
Persona 3 (Farmers)

- Not technically inclined
- Wants to find the best way to spray pesticide in order to maximize pesticide efficiency at three different levels of corn canopies
- Wants maximum profit from his field



User Needs

- Want accurate readings of sensor data
- Need data readings from multiple levels of crop canopies
- Need data sent to a master node by wireless mesh network
- Need the product to perform shortly after pesticide is sprayed on our devices to get better results
- Needs a final design on a PCB



Conclusions

- Finding the best way to accurately read the distribution of pesticide over corn crop canopies
 - Includes having our devices in a “mesh network” that can communicate with a master node and give the user the desired data