



Capstone Design Project Abstract

Project Title: PlantFi - Smart Agriculture Monitor with IoT

Sponsor: Plantfi

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Faculty Mentor: Chris Rhodes

This project aims to design and construct an IoT plant sensor that keeps track of critical details that factor into plant growth and health. This information would be transmitted to users alongside recommendations that would help them better manage the resources they give to plants and decrease their water and energy use.

With 50 million self-identified “Plant Parents” having killed an average of 7 houseplants, there is an estimated loss of \$8.5 billion dollars when it comes to plant care in the United States. Weather fluctuations, varying needs, and the lack of established plant health data make keeping a houseplant alive excessively difficult. There is additionally a gap in the market as no data-focused recommendations are available to customers and existing tools are outdated and highly inaccurate.

PlantFi is a device that measures four key metrics of plant health: soil moisture, temperature, sunlight, and humidity. When the device is inserted into the plant soil, the accompanying PlantFi mobile application reads the data and compares it to standard metrics for the identified plant. Then, it can detect unideal plant care conditions and will notify the user with recommendations for adjusting their care plan.

The project team has developed a fully functional beta prototype for PlantFi. The core of the device is a custom designed printed circuit board which is integrated with the necessary sensors. These sensors measure the plant health metrics and use a wifi chip to transmit that information to the user’s PlantFi application. The hardware sits inside of an aesthetically pleasing, waterproof case that has openings that allow the sensors to take their readings. The PlantFi application can accommodate multiple plants per user, identify common houseplant species by photo upload, and display plant health metrics. The algorithms designed for these aforementioned purposes are optimized for the majority of the most commonly owned house plants in the United States. This device and the accompanying app are an amalgam of hardware and software, technology and nature, and form and function.

Moving forward, the project team will work towards releasing the product to a group of beta testers and marketing it to grow an audience for the official release. PlantFi will serve consumers by keeping houseplants alive and making plant care more accessible.