

Abstract

Growing indoor potted plants is widely enjoyed hobby amongst a large variety of consumers. There are professionals who have great experiences and knowledge, and know exactly what each and every one of their plant requires. Each plant will have its own specific requirements like light exposure, ambient temperature and humidity, and soil moisture levels. For an amateur plant grower, this can be a difficult task. How will one know how to manipulate all these conditions to the exact requirement of the specific plant one wishes to grow? This project explores this problem by proposing an automated solution to this problem.



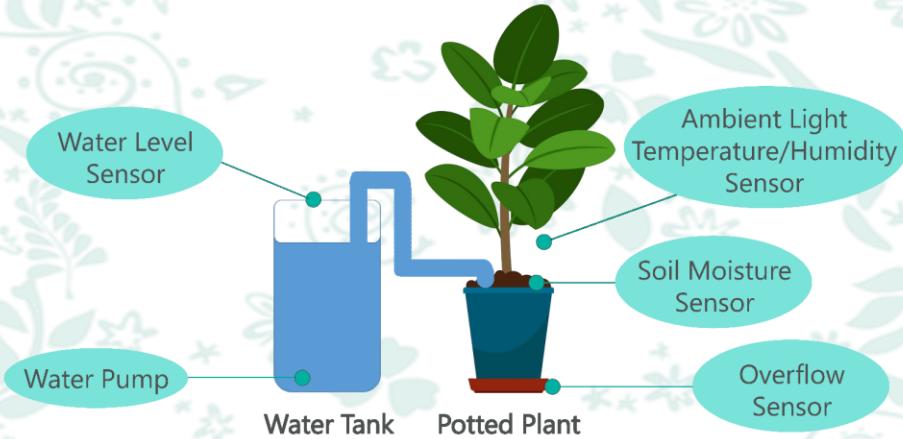
Introduction

This project is an addition to a previous ESD capstone project for detecting soil moisture. This project will add a new feature by detecting soil moisture, and automatically watering the plant based on its requirements. This project is an initial step to bringing automation to plant growth. Plant growth requires monitoring and controlling key elements such as light exposure, atmosphere temperature and humidity, and supplying sufficient water. This project's main focus is to provide sufficient amount of water to the plant based on the user input of soil moisture requirements.

Automated Plant Watering

JTA Embedded Systems Development Solutions Capstone Project 2018

SOLUTION



Key Features

Intelligent Pot Size Learning:

Larger pots will require long watering times and smaller pots will require shorter watering times. This system is setup to learn the size of the pot at initial setup before starting regular functionality.

Soil moisture level input:

The user has the option of selecting a specific moisture level that the system will always maintain or selecting a minimum and maximum moisture level, in which case the plant will only get watered when the soil moisture goes below the minimum.

Supply Water Level & Overflow Detection:

The system includes a water level detection for the water supply and can notify the user to refill the water. The system also has a water overflow detection to shut down the water supply if there is an overflow of water from the pot.

Ambient Light/Temperature/Humidity Monitoring

Results & Conclusions

All requirements and additional features were achieved in this project. It is definitely possible to automate plant growing and assist consumers in providing optimal conditions for growing the plants of their choice. Supplying sufficient water to the plant is one of the crucial steps in successful plant growth, and this system was able to deliver an automated solution to this step.

Future Work

- Plant Database - eliminate the requirement for having to setup the soil moisture levels
- Providing useful feedback to user about ambient readings and whether the amount of light, temperature and humidity in order to expose the plant to optimal conditions
- Automated light exposure

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Acknowledgements:

Robert Elder – Project Sponsor
Ralph Stacey – Project Mentor

[Darwin Padoocatlevilla, Bhavyasree Cherukat, and Selbin Thelakkadan Xavier]
Soil Moisture Monitoring Project (August 2018)