Planter’s Guide

Track your plants health to be sure they’re happy and healthy

Project Purpose

Our project is designed to act as a tool that plant owners can use to monitor the health of their specific species of plant. By using this tool, plant owners will be able to know when they need to take care of their plant, or they can even have the plant be automatically watered if they are unable to.

Goals

- Create an easily digestible Android app that displays plant health
- Create a back-end SQL database that contains required plant info
- Design and build an automatic watering device

Project Abstract

Planter's Guide is an Android application that will display moisture and sunlight levels of the user's plant. The plant will be hooked up to a raspberry pi via moisture and sunlight sensors. The raspberry pi will communicate with a backend SQL database to relay the expected moisture and sunlight levels of the plant species to the application, and the application will notify the user if either of these levels go below their minimum value. Alongside the application, an automatic watering device will be used to water the plant if the user is unable to.

Meet the Team

Christopher Butts : buttscm@mail.uc.edu

Kevin Eaton : eatonko@mail.uc.edu

Raymond Gee : geern@mail.uc.edu

Advisor

Dr. Badri Vellambi

Division of Work

Average Effort:

Chris: 41.39%
Kevin: 33.3%
Raymond: 25.31%

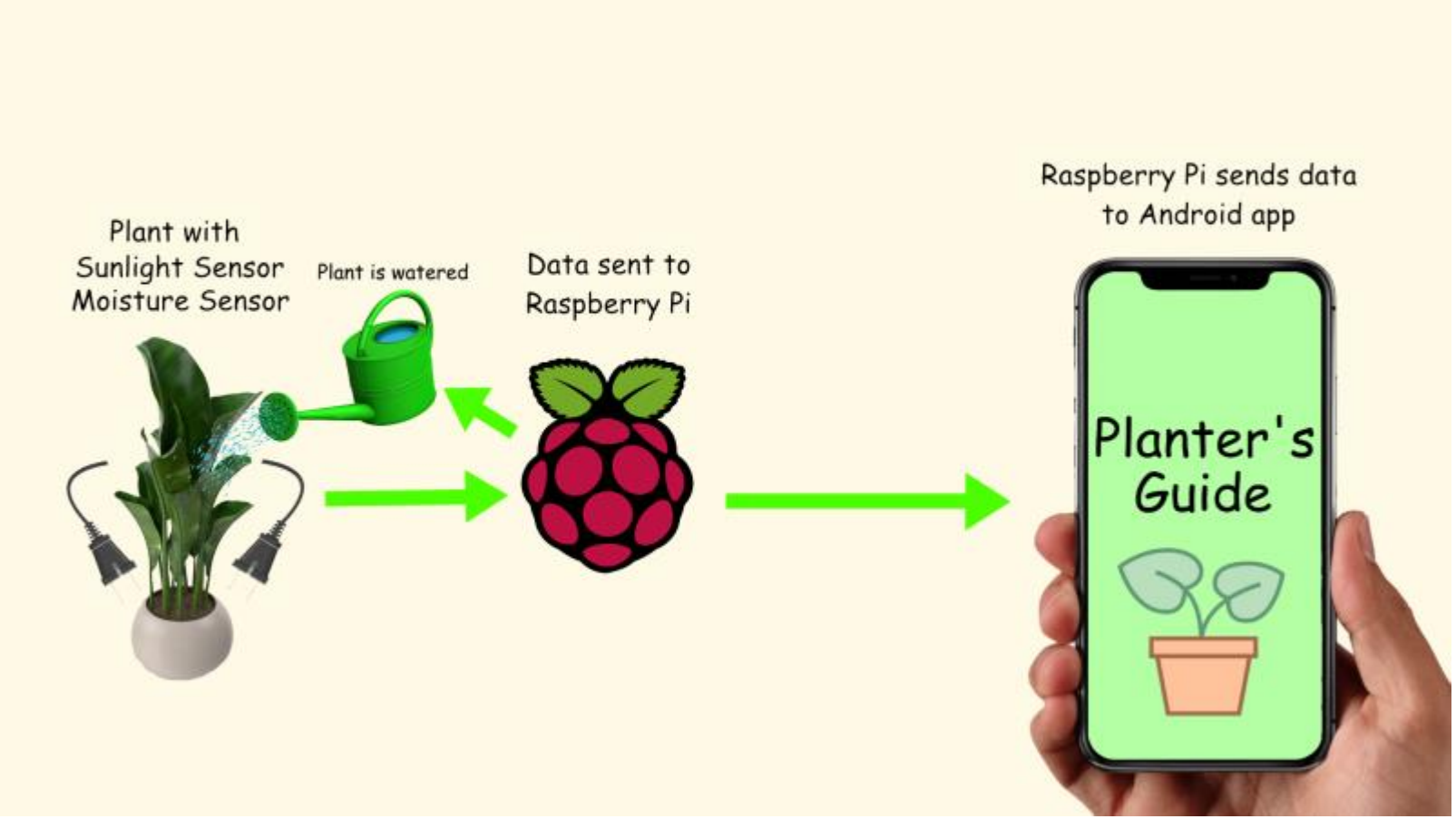
*Values end up skewed due to the 100% effort purchasing tasks

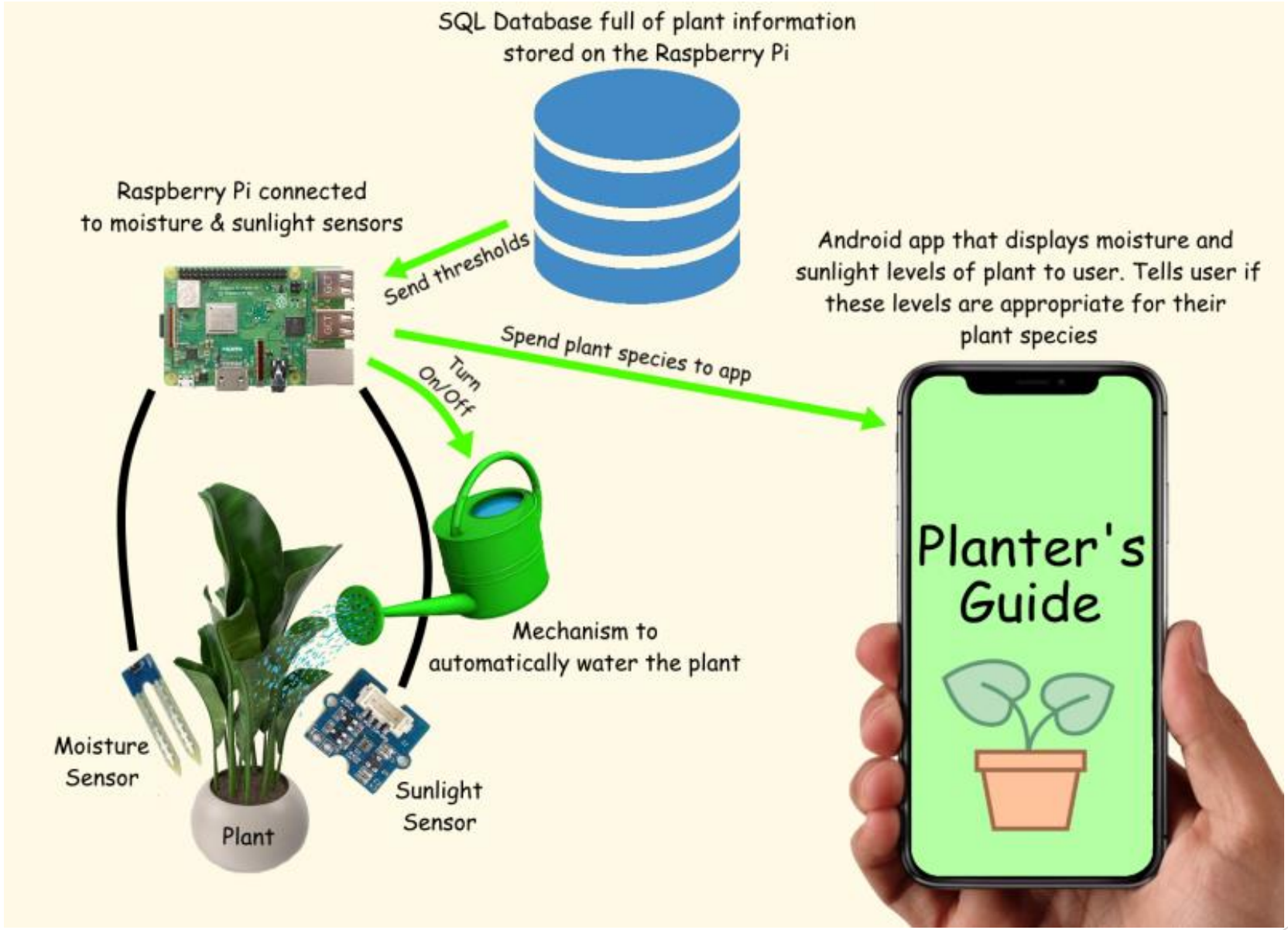
Task Name	Primary Team Member	Chris Effort	Kevin Effort	Raymond Effort
Purchase plant	Chris	100%	0%	0%
Purchase sensors	Kevin	10%	90%	0%
Draft auto-watering mechanism	Kevin	20%	60%	20%
Create SQL Database	Raymond	30%	0%	70%
Purchase parts for auto-watering mechanism	Kevin	0%	100%	0%
Research database storage options	Raymond	0%	20%	80%
Develop raspberry pi to android app method	Kevin	40%	60%	0%
Develop select to SQL database method	Raymond	5%	35%	60%
Implement functionality for invalid plant name	Raymond	30%	30%	40%
Develop SQL database output to raspberry pi	Raymond	0%	40%	60%
Develop android app to raspberry pi method	Chris	60%	35%	5%
Develop skeleton of app	Chris	90%	5%	5%
Develop components that interact with raspberry pi	Chris	70%	20%	10%
Develop SQL output on raspberry pi to app method	Chris	60%	25%	15%
Develop method to send watering signal to raspberry pi	Kevin	40%	60%	0%
Develop automated watering mechanism	Kevin	10%	10%	80%
Develop notificaitons	Chris	100%	0%	0%
Create app UI	Chris	80%	10%	10%

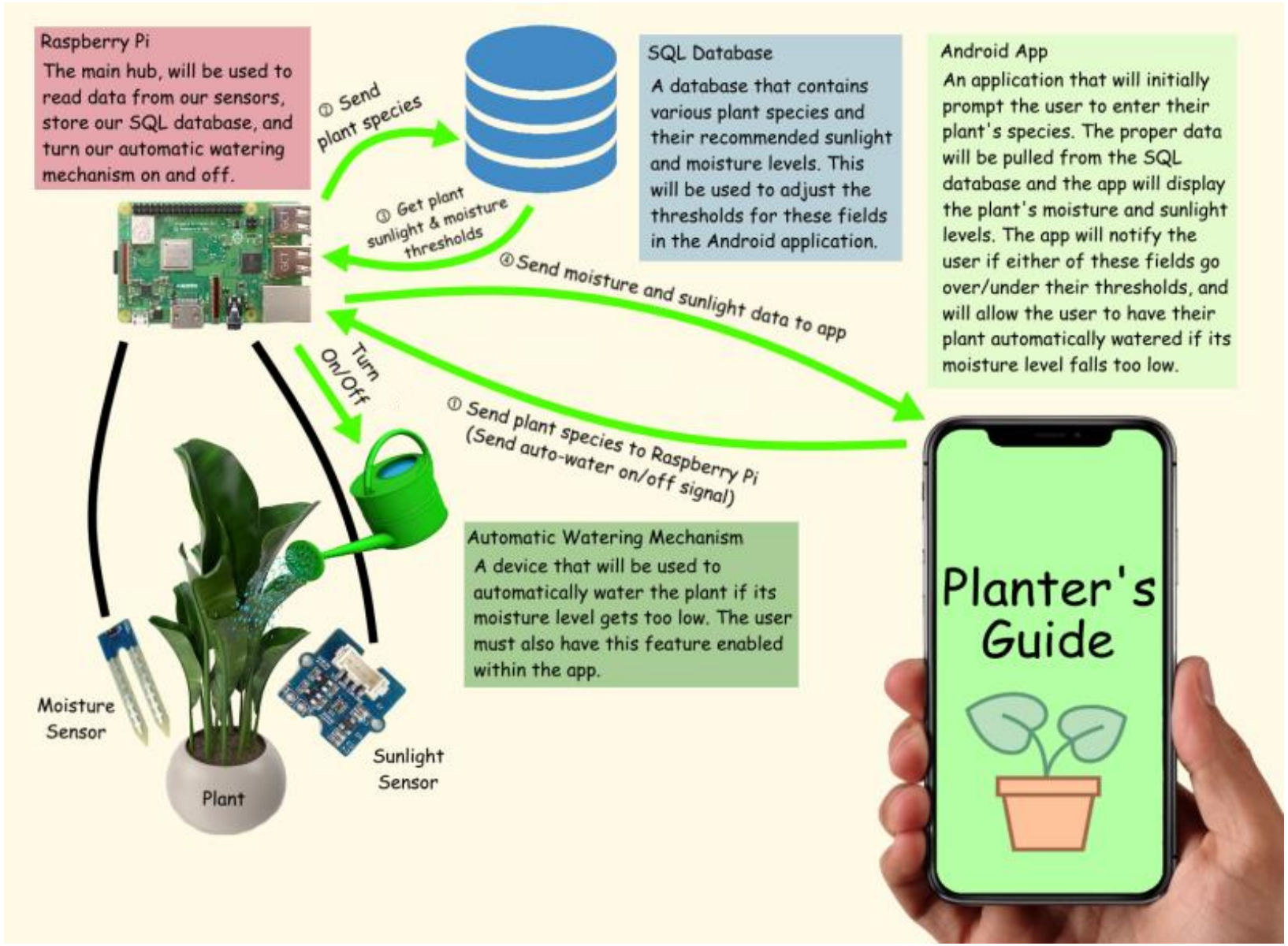
User Stories

- Gale Cumbritch – Beginner Plant Mom
  - As a plant owner, I want to be notified if my plant needs more or less sun and water, so that I can make sure it is happy and healthy!
- Phillip Dunks – The Busiest Businessman in Ohio
  - As a forgetful person, I want a way to automatically water my plant if I forget to, so that my plant doesn't shrivel up and die.
- Alan Oldinsen – The Plant Whisperer
  - As a plant enthusiast, I want to know the proper sun and moisture levels for my species of plant, so that I can adjust my plant's placement and my watering habits accordingly.

Design Diagrams




SQL Database full of plant information
stored on the Raspberry Pi
Raspberry Pi connected
to moisture & sunlight sensors
Send thresholds
Android app that displays moisture and
sunlight levels of plant to user. Tells user if
these levels are appropriate for their
plant species
Spend plant species to app
Turn
On/Off
Planter's
Guide
Mechanism to
automatically water the plant
Moisture
Sensor
Sunlight
Sensor
Plant


Raspberry Pi
The main hub, will be used to read data from our sensors, store our SQL database, and turn our automatic watering mechanism on and off.
② Send plant species
SQL Database
A database that contains various plant species and their recommended sunlight and moisture levels. This will be used to adjust the thresholds for these fields in the Android application.
Android App
An application that will initially prompt the user to enter their plant's species. The proper data will be pulled from the SQL database and the app will display the plant's moisture and sunlight levels. The app will notify the user if either of these fields go over/under their thresholds, and will allow the user to have their plant automatically watered if its moisture level falls too low.
③ Get plant sunlight & moisture thresholds
④ Send moisture and sunlight data to app
Turn On/Off
① Send plant species to Raspberry Pi (Send auto-water on/off signal)
Automatic Watering Mechanism
A device that will be used to automatically water the plant if its moisture level gets too low. The user must also have this feature enabled within the app.
Moisture Sensor
Sunlight Sensor
Plant
Planter's Guide

Project Constraints

- **Social** – Project is designed for use by the general public, but the final product will require having a raspberry pi w/ sensors and our automatic-watering mechanism: both cumbersome to obtain by a regular person
- **Environmental** – This project is made with a single potted plant in mind, so using this with a garden or a pot with multiple plant species won't work.
- **Technical** – Our team is 3 CS majors unfamiliar with hardware, yet we will be tackling a hardware implementation (automatic watering mechanism)
- **Time** – We're all busy people who will be graduating in the spring, so it'll just be important to make sure we manage our time well and roughly stick to our timeline.

Project Progress

Work has not formally started on the project at this time. However, we have drafted up all previous required formal documents, and we are currently working on creating a webpage scraper to aid in gathering the data we need for the SQL database to make that portion of the project easier.

Expected End of Term Progress

Ideally, by the end of this term and by the start of the spring semester, we should have obtained all the required hardware as well as have a rough design draft of our automated watering device. We should also be in the initial stages of creating our SQL database.

Expected Expo Demo

At the tech expo, we plan to show off all the functionality we can. We'll bring in the plant we've used for testing and show off how the sensors send data to the app so that it properly displays the correct moisture & sunlight levels.

From here, we can then show off the automatic watering, and show that the app will update the moisture level for the plant in real time.