Plant Parenthood

Abstract

Plants are a great way to brighten up any space and tend to provide many benefits for those who own them. However, plants are complex living things that require care and attention, often having needs that are specific to a certain plant type. It can be difficult for inexperienced plant owners to cultivate and maintain gardens or individual plants when they don't know the needs of every type of plant they own. This is the problem that Plant Parenthood seeks to remedy.

We've developed a solution using several new technologies to measure factors essential to plant health. By utilizing several sensors to measure soil moisture, atmospheric pressure, temperature, humidity, and light exposure we are able to provide valuable feedback to the user who is unsure of how to take care of their plant. To do this, we have attached a low-profile Raspberry Pi to a plant's pot, and we have developed a service utilizing the gRPC protocol to communicate between our server, database, and Android client. Our application is developed in Python, Protobuf, C#, Microsoft SQL, and Kotlin respectively. Every ten minutes we are gathering current plant data and logging it in the database, so that the user can view historical data regarding the plant's health.

Additionally, every three hours the data gathered is then analyzed and compared to values in the database that establish healthy boundaries for different plant types to determine if they are in a healthy range. If the plant factors found are outside of this predetermined range, we notify the user of the issue and advise on how to best take care of the plant going forward. Our database includes information on several different types of common plants, so the user is free to branch out from the usual plants they have with confidence in their ability to care for their new addition.

Plant Parenthood offers a simple solution to the average person that wants plants to be part of their life. However, it may have implications beyond an individual with house plants. Greenhouses are used to grow anything from aesthetic flowers to food sources to medicinal herbs. In such massive quantities it can be hard to monitor the health of each individual plant, or even a group of plants. By enlarging the scale and adding a few more Plant Parenthood hubs, Plant Parenthood could be used to monitor the health of many plants at once, keeping the tender aware of the status of all plants, resulting in more yield from the crop and less wasted time and resources.