

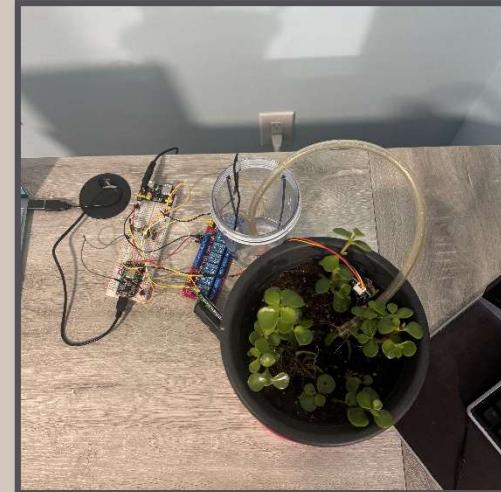
Plant-It – Smart Watering System

"A connected smart system to automate houseplant care"



BACKGROUND

Keeping plants healthy in a busy household isn't easy, especially when you have lots of them. With so many scattered around the house, it became difficult to remember which ones needed water, and when. Manual watering often led to plants going too long without care. **Plant-It** was our solution: a connected system that automates watering based on each plant's unique needs with no guesswork required.



HOW DOES IT WORK?

Plant-It integrates a capacitive moisture sensor, an **ESP8266** microcontroller (NodeMCU), and an IoT web app. Over **Wi-Fi**, the system pulls plant-specific moisture thresholds from a **React-based** app (using PI@ntNet and OpenAI APIs). A local web server enables dynamic plant pairing. Calibrated sensor data controls a relay-driven pump to deliver precise watering. The device can be easily reassigned to different plants via the web interface.

KEY FEATURES

- ⌚ Dynamic plant pairing – no reflashing
- 🌐 Wi-Fi connected to React web app
- 🧠 AI-enhanced species & care setup
- 💧 Adjustable sensor-based watering
- LCD Live LCD moisture + status display

CHALLENGES AND LESSONS

- ❖ Moved from Arduino Mega to ESP8266 (Wi-Fi) to enable web and app integration
- ❖ Replaced fixed thresholds with dynamic config sent from the web app (no reflashing needed)
- ❖ Added potentiometer to safely control pump flow after resistor solution wasn't viable
- ❖ Tuned loop timing to keep LCD updates smooth while handling Wi-Fi requests on the MCU

FUTURE IDEAS

- ❖ Integrated water tank system
- ❖ Custom PCB for compact design
- ❖ Remote plant status via mobile app
- ❖ Add light / temp sensors (full health)
- ❖ Cloud logging of watering history

