

Smart Farm IoT Monitoring System

Tools: ESP32, Blynk IoT, DHT22, Soil Moisture Sensor

Overview: Built a remote IoT system for monitoring farm environmental parameters such as temperature, humidity, and soil moisture using ESP32 and Blynk.

Objectives

- Enable real-time remote monitoring.
- Send notifications for threshold breaches.
- Provide a mobile interface for farmers.

Technical Approach

- Configured ESP32 Wi-Fi and Blynk API integration.
- Used DHT22 and soil moisture sensors for environmental data.
- Published readings to the Blynk app every 5 seconds.
- Implemented threshold alerts via Blynk events.

Challenges & Solutions

Challenge: Wi-Fi instability

Solution: Added reconnection routines in the ESP32 firmware.

Challenge: Sensor calibration

Solution: Applied regression-based calibration curves.

Results

Enabled continuous real-time monitoring and early irrigation control decisions.

Future Enhancements

Integrate relay-based irrigation control and weather forecast API.