TOP STUDENT PROJECTS

Best innovations from VTU, Chintamani

PROJECT TITLE

AI-Based Smart Hydroponic Farming System with Adaptive Nutrient Control and Closed-Loop Water Management

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PROBLEM STATEMENT

How Might We help Urban farmers and hydroponic researchers to use an intelligent, remote-controlled system to manage crops from manual nutrient mixing and inconsistent water quality levels to 100% automated nutrient control and 24/7 remote monitoring so as to grow more food in less space while cutting waste by 30% despite sensitive sensors that drift and the difficulty of coding for living plants

SOLUTION

The AI-Based Smart Hydroponic Farming System continuously monitors nutrient concentration and water conditions using TDS and temperature sensors. An ESP32 controller automatically regulates nutrient supply and water circulation through pumps, maintaining optimal growing conditions for plants. The system uses closed-loop water management to reduce wastage and provides real-time remote monitoring through Wi-Fi connectivity and an ESP32-CAM. This solution improves crop productivity, minimizes manual effort, conserves resources, and supports sustainable hydroponic farming.





SCAN ME

Technology stacks:

- ESP32-CAM
- DS18B20 Temperature Sensor
- TDS Sensor
- Hydroponic Farming Setup
- Adaptive Nutrient Control System