

INTEGRATION OF IOT AND DEEP LEARNING FOR AGRICULTURE AUTOMATION AND MONITORING

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This project uses a system integrating deep learning and IoT devices to automate crop monitoring and control in the field. Real-time crop disease detection of images transmitted by ESP32 CAM cameras uses a convolutional neural network that identifies diseases in crops before symptoms begin to show. Automated Irrigation is a technique that utilizes soil moisture sensor data and also modulates watering according to the present conditions and helps in optimizing water-use efficiency. Environmental sensors track temperature, humidity levels which will automatically control fans and heaters so as to maintain the plant growing environment. The system's analytics that predict and respond rapidly enhance preventative care aimed at enhancing productivity. This is also available through Blynk IoT, which performs a complete produce monitoring that sends an early warning of possible diseases leading to appropriate responses, the key problems in traditional farming. The scalability of the AI sensor, which will respond to the imminent food shortages, does just that, agriculture is moving to precision data-based agriculture for sustainability. Integrated computer vision-based disease detection and sensor-based irrigation regulation system account for the unreliability brought by human crop supervision. The system which focuses on water, fertilizer and consumption energy efficiency with sensor readings as well as intelligent activation in addressing the current challenges is utilized.