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Artificial Intelligence and Internet of Things Solution for the Crop Disease Detection

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Abstract: *The integration of Artificial Intelligence (AI) and the Internet of Things (IoT) presents a transformative solution for addressing challenges in modern agriculture, particularly in the early detection and management of crop diseases. This project proposes an AI-IoT–based system designed to monitor crop health in real time, identify disease symptoms, and assist farmers in taking timely corrective actions. The system employs IoT-enabled sensors to collect environmental and soil data such as temperature, humidity, and moisture levels, while cameras capture images of crop leaves. The collected data are transmitted to a cloud platform where AI algorithms—especially deep learning models such as Convolutional Neural Networks (CNNs)—analyze the images to detect and classify potential diseases. Upon detection, the system alerts farmers via a mobile or web application, providing insights and recommendations for treatment. This approach reduces the dependency on manual inspection, enhances accuracy in disease identification, and supports sustainable agricultural practices through data-driven decision-making. Overall, the proposed AI and IoT solution offers an efficient, scalable, and cost-effective framework to improve crop yield, minimize losses, and promote smart farming.*

Keywords: Artificial Intelligence (AI), Internet of Things (IoT), Crop Disease Detection, Smart Agriculture, Precision Farming, Machine Learning (ML) , Deep Learning (DL),Convolutional Neural Networks (CNN), Computer Vision, Image Processing ,Edge Computing, Cloud Computing, IoT Sensors, Data Analytics, Environmental Monitoring, Predictive Analytics , Real-Time Monitoring , Sustainable Agriculture, Smart Farming System, Agricultural Automation, Remote Sensing, Plant Disease Classification, Sensor Network, Decision Support System (DSS, Agricultural IoT Architecture

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