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AI Techniques for Plant Disease Detection

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Abstract: *Plant diseases affect agricultural production, food security, and economic stability, making them a major concern for global agriculture. To reduce losses and guarantee sustainable farming methods, these diseases must be identified early and managed effectively. Manual inspections, which are labour-intensive, unreliable, and unscalable for large-scale agricultural applications, are frequently the basis of traditional disease monitoring techniques. Innovative approaches to plant disease tracking have been made possible by the quick development of artificial intelligence (AI), which offers improved scalability, accuracy, and efficiency. This study provides a comprehensive assessment of AI-based plant disease tracking systems, concentrating on techniques that integrate machine learning, deep learning, computer vision, and data-driven models. Key uses include integrating satellite imagery and IoT-enabled devices for real-time monitoring, predicting disease outbreaks using environmental data, and detecting diseases using picture processing. Additionally examined is the function of mobile applications in providing farmers with easily accessible diagnostic tools. The study also discusses important issues like model generalisation, data scarcity, computational constraints, and socioeconomic obstacles to AI adoption in agriculture. This review highlights the revolutionary potential of AI in building resilient agricultural systems, ultimately promoting global food security and sustainable development, by combining recent developments and pointing out research needs*

Keywords: Plant diseases

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