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Crop Analysis in Smart Agriculture: The Rise of AI and Remote Sensing

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Abstract: *Agriculture is undergoing a significant transformation driven by the integration of artificial intelligence (AI) and remote sensing technologies. Traditional farming methods often rely on manual observation and historical experience, which limits precision and scalability. Smart agriculture leverages data-driven techniques to improve crop productivity, resource efficiency, and sustainability. This paper presents a comprehensive study of crop analysis using AI and remote sensing, focusing on satellite imagery, unmanned aerial vehicles (UAVs), and machine learning models for crop health monitoring, yield prediction, soil assessment, and disease detection. The proposed approach highlights how spectral indices, deep learning models, and geospatial analytics enable real-time decision-making for farmers. The study emphasizes the growing role of AI-powered systems in addressing food security challenges while reducing environmental impact. The findings demonstrate that the combination of AI and remote sensing significantly enhances accuracy, efficiency, and scalability in modern agricultural practices.*

Keywords: Smart Agriculture, Crop Analysis, Artificial Intelligence, Remote Sensing, Precision Farming

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