World Academy of Science, Engineering and Technology
International Journal of Agricultural and Biosystems Engineering
Vol:18, No:08, 2024

AI-Based Autonomous Plant Health Monitoring and Control System with Visual Health-Scoring Models

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Abstract : This paper focuses on the development and implementation of an advanced plant health monitoring system with an AI backbone and IoT sensory network. Our approach involves addressing the critical environmental factors essential for preserving a plant's well-being, including air temperature, soil moisture, soil temperature, soil conductivity, pH, water levels, and humidity, as well as the presence of essential nutrients like nitrogen, phosphorus, and potassium. Central to our methodology is the utilization of computer vision technology, particularly a night vision camera. The captured data is then compared against a reference database containing different health statuses. This comparative analysis is implemented using an AI deep learning model, which enables us to generate accurate assessments of plant health status. By combining the AI-based decision-making approach, our system aims to provide precise and timely insights into the overall health and well-being of plants, offering a valuable tool for effective plant care and management.

Keywords : deep learning image model, IoT sensing, cloud-based analysis, remote monitoring app, computer vision, fuzzy control

Conference Title : ICABBBE 2024 : International Conference on Agricultural, Biotechnology, Biological and Biosystems Engineering

Conference Location : Istanbul, Türkiye

Conference Dates : August 15-16, 2024