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IMPLEMENTATION OF CROP PEST RECOGNITON AND CLASSFICATION USING IMAGE PROCESSING

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ABSTRACT

Effective pest management techniques are becoming more and more necessary as a result of agriculture's quick development to meet the world's rising food demand. Conventional manual techniques for classifying and identifying pests take a lot of time and are frequently prone to mistakes. This research proposes the use of image processing techniques to develop a reliable and automated system for crop pest recognition and classification in order to address these issues. Using image analysis, the suggested system will automatically identify and categorize agricultural pests. Targeted pesticide sprays will then be applied using IoT-enabled devices. In order to reduce environmental impact and maximize resource utilization, the suggested system focuses on automating the processes of insect recognition, classification, and targeted pesticide spraying. Using photos taken in the field, the system's initial module employs image processing algorithms to precisely identify and categorize agricultural pests. Using a variety of pest picture datasets, Convolutional Neural Networks (CNNs) are trained to produce a reliable pest classification model. This technique allows for accurate pest identification by differentiating between different pest species and healthy crops. The second module focuses on integrating

machines and IoT devices to facilitate targeted and effective pesticide application. Real-time data on crop health, pest populations, and environmental variables is collected via IoT sensors positioned across the field. In order to minimize total pesticide usage and lessen environmental harm, automated pesticide sprayers with precision spraying mechanisms are used to apply pesticides selectively to regions where pest infestations exist.

KEYWORDS: *Deep Learning, Pest Detection, Disease Classification, Image Processing, Convolutional Neural Network (CNN), Generative Adversarial Networks (Gans).*

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