

Green Guard: A Deep Learning-Based Android Application for Detecting Plant Diseases

M.B.F. Sanjeetha

*Department of Management & IT,
Faculty of Management and Commerce, South Eastern University of Sri Lanka.*

Sanjeetha.mit@seu.ac.lk

ABSTRACT

Purpose: This research aims to expedite the diagnosis of plant diseases to avert agricultural losses. Considering that plant diseases account for up to 40% of global food crop losses, this study employs advanced deep-learning techniques for rapid and efficient diagnosis. This proactive strategy enhances agricultural output and sustainability.

Design/methodology/approach: The study classified leaf images as healthy or diseased using a CNN. Several pre-processing methods improve model correctness and durability. Real agricultural photos were added to the training dataset to increase the data collection. Hyperparameter adjustment and deep learning architecture evaluation optimized model performance. The model was eventually incorporated into a simple IoT smartphone app for real-time disease detection and reporting.

Findings: The research created an accurate CNN picture classification model. In particular, the model obtained up to 95% accuracy on a smaller sample of 300 authentic leaf photos and 92% accuracy on an improved dataset of 2800 images. When taught with additional data, the deep learning model may reliably identify plant illnesses, making it a reliable early disease detection tool.

Practical implications: This model may be integrated into an IoT smartphone app to help farmers and agricultural specialists monitor and manage diseases in real-time. The method quickly and accurately identifies plant diseases, reducing crop losses, improving food security, and benefiting farmers, particularly in agriculturally dependent countries.

Originality value: Deep learning and IoT-based plant disease monitoring technologies are novel in agricultural technology, and this study advances the field. This method integrates accurate deep-learning models with real-world crop disease control applications.

Keywords: *Plant disease Detection, Machine Learning, Mobile Application, CNNs, GreenGuard*