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In Collaboration with

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Tomato Leaf Disease Detection Using Machine Learning

A Final Thesis by

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Abstract

Tomato cultivation in Sri Lanka faces challenges from unreliable disease identification systems, impacting crop yields. To address this, an innovative and user-friendly plant disease identification system is needed, utilizing advanced machine learning techniques to accurately detect various tomato leaf diseases, focusing on the Plateena variant. Overcoming funding and skill limitations is crucial for successful implementation.

An automated system using optimized Convolutional Neural Networks (CNNs) is proposed to identify similar-looking tomato leaf diseases specific to the Plateena variety, considering its unique visual symptoms. A diverse dataset reflecting Plateena's characteristics and Sri Lanka's environment will be collected for effective model training. A mobile app will be developed for convenient disease detection, even in remote areas.

The system's success will be evaluated through data science metrics, including accuracy, precision, recall, and F1-score. Testing will involve a large-scale dataset representing popular tomato leaf diseases in Plateena. By closing the research gap in machine learning-based methods, this project aims to contribute to plant disease detection knowledge, benefitting Sri Lankan tomato growers with improved crop yields and food security.

Keywords: Tomato leaf diseases, Plateena variety, Convolutional Neural Networks, machine learning, disease identification, Sri Lanka, crop yields, data science metrics.

Subject Descriptors: Agriculture, Plant Diseases, Machine Learning, Deep Learning, Convolutional Neural Networks, Disease Detection, Tomato Cultivation, Sri Lanka.