



D-TRACK: AI-Based Durian Disease Detection via Image Processing and Deep Learning

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Abstract

Durian is one of Thailand's most important economic crops and a major source of export revenue. However, diseases such as root rot, stem rot, and foliar diseases continue to reduce yield and fruit quality. Current disease monitoring mainly relies on farmers' visual inspection and experience, making early detection difficult and often leading to increased crop losses and higher orchard management costs.

To address this challenge, D-TRACK was developed as an automated durian disease monitoring system integrating Artificial Intelligence (AI), Deep Learning, robotics, and a web-based platform. A robotic prototype autonomously captures orchard images, while the YOLOv8 model detects and classifies diseases from durian leaf images. The analysis results are displayed through the web platform, allowing users to conveniently monitor orchard conditions.

Experimental results showed that the proposed model achieved a disease detection accuracy of 95.68%. Images collected from real orchards were successfully analyzed through the integrated system, demonstrating its practicality for automated disease surveillance. The innovation has the potential to reduce agricultural losses, improve orchard management efficiency, and support the advancement of smart and sustainable agriculture.

Keywords: Artificial Intelligence (AI), Agricultural Robotics, Smart Orchard Management