

ABSTRAK

APLIKASI LEAFXPERT UNTUK DETEKSI PENYAKIT DAUN TANAMAN CABAI MENGGUNAKAN ALGORITMA *YOU ONLY LOOK ONCE*

(2026:X + 81 halaman + 11 gambar + 9 tabel + 8 lampiran)

MUHAMMAD RIFKI RAHMAN

062240352312

JURUSAN TEKNIK ELEKTRO

**PROGRAM STUDI SARJANA TERAPAN TEKNIK TELEKOMUNIKASI
POLITEKNIK NEGERI SRIWIJAYA**

Penyakit pada daun tanaman cabai merupakan salah satu faktor yang dapat menurunkan kualitas pertumbuhan tanaman sehingga diperlukan suatu sistem yang mampu membantu proses identifikasi penyakit secara cepat dan akurat. Penelitian ini bertujuan mengembangkan aplikasi LeafXpert berbasis Android yang mampu mendeteksi penyakit daun cabai secara *real-time* menggunakan algoritma *You Only Look Once* versi 8 Nano (YOLOv8n). Pengembangan sistem diawali dengan pengumpulan dan pengolahan dataset citra daun cabai yang terdiri atas lima kelas, yaitu *healthy*, *bacterial spot*, *cercospora*, *leaf blight*, dan *leaf curl*. Selanjutnya dilakukan proses pelatihan model menggunakan framework Ultralytics YOLOv8n, kemudian model terbaik dikonversi ke format TensorFlow Lite agar dapat diimplementasikan pada perangkat Android. Pengujian dilakukan terhadap performa model serta fungsionalitas aplikasi menggunakan metode Black Box Testing. Hasil penelitian menunjukkan bahwa model YOLOv8n memperoleh nilai *Precision* sebesar 97,9%, *Recall* sebesar 98,0%, mAP50 sebesar 98,2%, dan mAP50-95 sebesar 85,4%, serta seluruh fitur aplikasi berhasil berjalan sesuai dengan rancangan. Aplikasi mampu menampilkan hasil deteksi beserta nilai *confidence*, informasi penyakit, penyebab, penanganan, dan riwayat hasil deteksi sehingga dapat mendukung proses identifikasi penyakit daun cabai secara praktis melalui perangkat bergerak. Penelitian selanjutnya diharapkan dapat mengembangkan sistem dengan menambah variasi dataset, meningkatkan kemampuan deteksi pada kondisi lingkungan yang lebih beragam, serta mengintegrasikan aplikasi dengan teknologi *cloud* atau Internet of Things (IoT) agar dapat mendukung pemantauan kesehatan tanaman secara lebih komprehensif.

Kata Kunci: Android, Deteksi Penyakit Daun Cabai, *Deep Learning*, TensorFlow Lite, YOLOv8n.

ABSTRACT

LEAFXPERT APPLICATION FOR CHILI PLANT LEAF DISEASE DETECTION USING THE YOU ONLY LOOK ONCE ALGORITHM

(2026:X + 81 pages + 11 figure + 9 table + 8 appendixes)

MUHAMMAD RIFKI RAHMAN

062240352312

DEPARTEMENT OF ELECTRICAL ENGINEERING

APPLIED BACHELOR'S STUDY PROGRAM IN TELECOMMUNICATION ENGINEERING

SRIWIJAYA STATE POLYTECHNIC

Diseases affecting chili plant leaves are one of the factors that can reduce plant growth quality, making a system capable of supporting rapid and accurate disease identification highly desirable. This study aims to develop LeafXpert, an Android-based application that performs real-time detection of chili leaf diseases using the You Only Look Once version 8 Nano (YOLOv8n) algorithm. The system was developed by collecting and processing a dataset of chili leaf images consisting of five classes: Healthy Leaf, Bacterial Spot, Cercospora, Leaf Blight, and Leaf Curl. The YOLOv8n model was trained using the Ultralytics framework, and the best-performing model was converted into the TensorFlow Lite format to enable deployment on Android devices. Model performance and application functionality were evaluated using standard object detection metrics and Black Box Testing. The experimental results show that the proposed model achieved a Precision of 97.9%, Recall of 98.0%, mAP50 of 98.2%, and mAP50-95 of 85.4%, while all application features operated successfully according to the system design. The application provides disease detection results along with confidence scores, disease descriptions, causes, treatment recommendations, and detection history, making it a practical tool for identifying chili leaf diseases on mobile devices. Future research is expected to expand the dataset, improve detection performance under more diverse environmental conditions, and integrate cloud computing or Internet of Things (IoT) technologies to support more comprehensive crop health monitoring.

Keywords: *Android, Chili Leaf Disease Detection, Deep Learning, TensorFlow Lite, YOLOv8n.*