

ABSTRAK

Produksi buah jambu biji sering mengalami penurunan akibat serangan penyakit yang sulit dikenali secara dini oleh petani. Kurangnya pengetahuan tentang gejala visual penyakit membuat proses identifikasi menjadi lambat dan tidak akurat, sehingga menghambat upaya pengendalian. Penelitian ini bertujuan untuk mengembangkan sistem deteksi penyakit pada buah jambu biji menggunakan metode *Convolutional Neural Network* (CNN) berbasis arsitektur VGG16 dan diimplementasikan dalam aplikasi Android. Model CNN dikembangkan untuk mengklasifikasikan empat kondisi buah, yaitu *Healthy*, *Phytophthora*, *Scab*, dan *Styler End Rot*. Dataset yang digunakan telah melalui proses *preprocessing* seperti *resizing*, pembagian data, augmentasi, dan normalisasi. Model terbaik diperoleh dengan kombinasi *learning rate* 0,001, optimizer SGD, dan *dropout* 0,5. Hasil evaluasi menunjukkan akurasi sebesar 90,70%, *precision* 90,87%, *recall* 90,68%, dan *F1-score* 90,68%. Model diimplementasikan menggunakan Google Cloud Run dan disimpan di Google Cloud Storage. Aplikasi Android yang dikembangkan menyediakan fitur login, klasifikasi gambar, dan riwayat prediksi. Pengujian menggunakan metode *Blackbox Testing* menunjukkan seluruh fitur berjalan sesuai dengan spesifikasi yang dirancang.

Kata Kunci: aplikasi Android, *Convolutional Neural Network* (CNN), jambu biji, klasifikasi citra, VGG16

ABSTRACT

Guava fruit production often declines due to diseases that are difficult for farmers to recognize early. A lack of knowledge about the visual symptoms of these diseases results in slow and inaccurate identification, hindering effective control efforts. This study aims to develop a disease detection system for guava fruit using a Convolutional Neural Network (CNN) based on the VGG16 architecture, implemented in an Android application. The CNN model is designed to classify four fruit conditions: Healthy, Phytophthora, Scab, and Styler End Rot. The dataset used has undergone preprocessing steps including resizing, data splitting, augmentation, and normalization. The best performing model was obtained using a learning rate of 0.001, the SGD optimizer, and a dropout rate of 0.5. Evaluation results show an accuracy of 90.70%, precision of 90.87%, recall of 90.68%, and an F1-score of 90.68%. The model is deployed using Google Cloud Run and stored in Google Cloud Storage. The developed Android application provides features such as login, image classification, and prediction history. Testing using the Blackbox Testing method indicates that all features function according to the designed specifications.

Keywords: *Android application, Convolutional Neural Network (CNN), guava, image classification, VGG16*