

ABSTRAK

Penyakit pada tanaman padi merupakan ancaman serius dalam sektor pertanian karena dapat menurunkan hasil panen secara signifikan. Upaya deteksi dini menjadi langkah penting untuk mencegah kerugian yang lebih besar. Penelitian ini memanfaatkan metode *Convolutional Neural Network* (CNN) dengan arsitektur *MobileNetV3 Large* berbasis *TensorFlow*. Model dilatih menggunakan 13.876 citra daun padi dari 10 kelas, termasuk kondisi normal. Tahapan pengembangan meliputi augmentasi data, pra-pemrosesan, serta pengujian delapan konfigurasi *hyperparameter*. Konfigurasi terbaik diperoleh pada *batch size* 32, *learning rate* 0,0003, *epoch* 30, *dropout* 0,4, dan metode *oversampling*, yang menghasilkan akurasi validasi sebesar 95%. Model kemudian diimplementasikan dalam aplikasi Android untuk mendukung deteksi secara langsung di lapangan. Evaluasi dengan 100 citra uji memperlihatkan akurasi klasifikasi tinggi pada kelas *dead heart*, *hispa*, *tungro*, dan *bacterial panicle blight* dengan *confidence score* konsisten di atas 90%, sedangkan kelas *brown spot*, *blast*, dan normal masih menunjukkan ketidakstabilan. Hasil penelitian ini membuktikan bahwa konfigurasi ketujuh layak digunakan dengan rata-rata akurasi prediksi akhir sebesar 89%.

Kata Kunci: *Convolutional Neural Network*, *MobileNetV3 Large*, penyakit tanaman padi, *TensorFlow*, klasifikasi citra, Android, deteksi penyakit.

ABSTRACT

Rice plant diseases pose a serious threat in the agricultural sector as they can significantly reduce crop yields. Early detection plays a crucial role in preventing further losses. This research employs the Convolutional Neural Network (CNN) method with the MobileNetV3 Large architecture based on TensorFlow. The model was trained using 13,876 rice leaf images from 10 classes, including the normal condition. The development stages consisted of data augmentation, preprocessing, and testing of eight hyperparameter configurations. The best configuration was obtained with a batch size of 32, a learning rate of 0.0003, 30 epochs, a dropout rate of 0.4, and the use of oversampling, resulting in a validation accuracy of 95%. The model was then implemented in an Android application to enable direct detection in the field. Evaluation using 100 test images demonstrated high classification accuracy in classes such as dead heart, hispa, tungro, and bacterial panicle blight, with confidence scores consistently above 90%, while brown spot, blast, and normal classes still showed instability. The findings indicate that the seventh configuration is feasible for application, with a final average prediction accuracy of 89%.

Keywords: *Convolutional Neural Network, MobileNetV3 Large, rice plant disease, TensorFlow, image classification, Android, disease detection.*