

ABSTRAK

Reza Satia Mukti. 2026. *Klasifikasi Jenis Penyakit Tomat dan Kentang Menggunakan Metode Convolutional Neural Network Berbasis Android*. Skripsi. Program Studi Teknik Informatika, Fakultas Teknik, Universitas PGRI Madiun. Pembimbing (I) Slamet Riyanto, S.T., M.M, Pembimbing (II) Saifulloh, S.Kom., M.Kom.

Indonesia merupakan negara agraris dengan tomat dan kentang sebagai komoditas hortikultura penting, namun produktivitasnya kerap terancam oleh berbagai penyakit tanaman. Identifikasi penyakit secara manual membutuhkan keahlian khusus, memakan waktu, dan rentan terhadap kesalahan. Penelitian ini bertujuan merancang dan membangun aplikasi berbasis *Android* untuk mengklasifikasikan jenis penyakit daun tomat dan kentang menggunakan metode *Convolutional Neural Network* (CNN). Model dibangun dengan menerapkan teknik *transfer learning* pada arsitektur *MobileNetV2* yang telah dilatih sebelumnya (*pre-trained*) pada *dataset ImageNet*, kemudian dilakukan *fine-tuning* menggunakan *dataset* citra sebanyak 10.588 gambar yang terbagi ke dalam 9 kelas. *Dataset* dibagi menjadi 80% data latih (8.471 gambar) dan 20% data validasi (2.117 gambar). Model yang telah dilatih dikonversi ke format *TensorFlow Lite* agar dapat berjalan secara *offline* pada perangkat *Android*. Pengembangan aplikasi menggunakan metode *Rapid Application Development* (RAD), sedangkan pengujian dilakukan melalui pengujian fungsionalitas serta pengujian kebergunaan menggunakan *System Usability Scale* (SUS). Hasil penelitian menunjukkan bahwa model mencapai akurasi sebesar 99,58% dengan nilai *macro F1-score* 0,99 dalam mengklasifikasikan 9 kelas. Pengujian fungsionalitas menunjukkan seluruh fitur aplikasi berjalan sesuai kebutuhan, sedangkan pengujian kebergunaan memperoleh skor SUS sebesar 83,00 yang termasuk kategori dapat diterima (*acceptable*) dengan grade A (*excellent*). Dengan demikian, aplikasi yang dikembangkan dapat menjadi alat bantu identifikasi awal penyakit tanaman tomat dan kentang yang akurat dan mudah digunakan.

Kata Kunci: *Convolutional Neural Network, MobileNetV2, transfer learning, klasifikasi penyakit tanaman, Android, System Usability Scale*

ABSTRACT

Reza Satia Mukti. 2026. *Classification of Tomato and Potato Disease Types Using the Convolutional Neural Network Method Based on Android*. Undergraduate Thesis. Informatics Engineering Study Program, Faculty of Engineering, Universitas PGRI Madiun. Supervisor (I) Slamet Riyanto, S.T., M.M, Supervisor (II) Saifulloh, S.Kom., M.Kom.

Indonesia is an agrarian country in which tomato and potato are important horticultural commodities, yet their productivity is frequently threatened by various plant diseases. Manual disease identification requires specific expertise, is time-consuming, and is prone to error. This study aims to design and develop an Android-based application to classify the types of tomato and potato leaf diseases using the Convolutional Neural Network (CNN) method. The model was built by applying transfer learning to the MobileNetV2 architecture that had been pre-trained on the ImageNet dataset, and was then fine-tuned using an image dataset of 10,588 images divided into 9 classes. The dataset was split into 80% training data (8,471 images) and 20% validation data (2,117 images). The trained model was converted into the TensorFlow Lite format so that it could run offline on Android devices. The application was developed using the Rapid Application Development (RAD) method, while testing was carried out through functional testing and usability testing using the System Usability Scale (SUS). The results show that the model achieved an accuracy of 99.58% with a macro F1-score of 0.99 in classifying 9 classes. Functional testing showed that all application features worked as required, while usability testing obtained a SUS score of 83.00, which falls into the acceptable category with grade A (excellent). Thus, the developed application can serve as an accurate and easy-to-use tool for the early identification of tomato and potato plant diseases.

Keywords: *Convolutional Neural Network, MobileNetV2, transfer learning, plant disease classification, Android, System Usability Scale*