ABSTRACT

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TOMATO LEAF DISEASE CLASSIFICATION USING CONVOLUTIONAL
NEURAL NETWORK WITH VGG16 ARCHITECTURE
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Application

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Tomato (Solanum lycopersicum) is a significant horticultural commodity in Indonesia, but its production is often threatened by various leaf diseases. Visual identification of diseases on tomato leaves by farmers is often inaccurate, necessitating a more reliable system for detecting and classifying these diseases. This research developed a leaf disease classification system for tomato plants using the Convolutional Neural Network (CNN) method with the VGG16 architecture. The dataset used consists of 10,000 images divided into 10 classes of tomato leaf diseases, including Bacterial Spot, Early Blight, Late Blight, among others, as well as healthy leaf images. The developed CNN model was trained and evaluated using this dataset. The training results showed that the model achieved an accuracy of 98.56% on the training data and 91.20% on the validation data after 25 epochs. The model was then implemented into a web-based application using the Flask framework, allowing users to upload tomato leaf images and receive real-time classification results. The final evaluation demonstrated that the model provided accurate classification results on the test dataset, with a satisfactory confusion matrix for practical use in identifying tomato leaf diseases. This system is expected to assist farmers in more effectively and efficiently detecting tomato leaf diseases, thereby supporting sustainable tomato production. The implementation of this model in a web-based application also offers easy access for farmers and other users to quickly and accurately identify tomato leaf diseases.

Reference (2018 –2023)