

Sistem Klasifikasi pada Penyakit Daun Cabai Menggunakan Metode Convolutional Neural Network Berbasis Website

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ABSTRAK

Penyakit pada daun cabai seperti *Bacterial Spot*, *Cercospora Leaf Spot*, *Leaf Curl Virus*, *Nutrient Deficiency*, dan *Powdery Mildew* menjadi ancaman serius bagi produktivitas petani cabai di Indonesia, dengan kerugian ekonomi mencapai 30–50% dari total produksi, sementara identifikasi manual dinilai tidak efisien dan rawan kesalahan diagnosis. Penelitian ini membangun sistem klasifikasi penyakit daun cabai berbasis website menggunakan framework Laravel dan database MySQL, dengan menerapkan metode *Convolutional Neural Network* (CNN) berbasis arsitektur EfficientNet-B0 dan pendekatan *Transfer Learning* untuk mengklasifikasikan enam kelas kondisi daun cabai dari citra digital yang diunggah pengguna. Pengujian dilakukan menggunakan *Blackbox Testing* dan *User Acceptance Testing* (UAT). Hasil evaluasi model menunjukkan *accuracy* sebesar 96,08%, *precision* 96,65%, *recall* 96,16%, dan *F1-score* 96,32%, sedangkan hasil UAT menunjukkan tingkat penerimaan pengguna sebesar 90%. Sistem terbukti mampu mengidentifikasi penyakit daun cabai secara cepat dan akurat, sehingga dapat menjadi solusi teknologi bagi penyuluh tani maupun petani dalam melakukan deteksi dini penyakit tanaman cabai.

Kata Kunci: Klasifikasi Penyakit, Daun Cabai, Convolutional Neural Network, EfficientNet-B0, Laravel

**Sistem Klasifikasi pada Penyakit Daun Cabai Menggunakan Metode
Convolutional Neural Network Berbasis Website**

*(Classification System for Chili Leaf Diseases Using Convolutional Neural
Network Method Web-Based)*

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ABSTRACT

Diseases affecting chili leaves, such as Bacterial Spot, Cercospora Leaf Spot, Leaf Curl Virus, Nutrient Deficiency, and Powdery Mildew, pose a serious threat to chili farmers' productivity in Indonesia, with economic losses reaching 30–50% of total production, while manual identification is inefficient and prone to misdiagnosis. This study develops a web-based chili leaf disease classification system using the Laravel framework and MySQL database, applying a Convolutional Neural Network (CNN) method based on the EfficientNet-B0 architecture with a Transfer Learning approach to classify six classes of chili leaf conditions from digital images uploaded by users. Testing was conducted using Blackbox Testing and User Acceptance Testing (UAT). Model evaluation results show an accuracy of 96.08%, precision of 96.65%, recall of 96.16%, and F1-score of 96.32%, while UAT results show a user acceptance rate of 90%. The system proved capable of identifying chili leaf diseases quickly and accurately, making it a technology-based solution for agricultural extension workers and farmers in the early detection of chili plant diseases.

Keywords: Disease Classification, Chili Leaf, Convolutional Neural Network, EfficientNet-B0, Laravel