

PERBANDINGAN MODEL ARSITEKTUR MOBILENETV2 DAN RESNET-50 PADA KLASIFIKASI PENYAKIT DAUN STROBERI DI DESA PANCASARI

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ABSTRAK

Pertanian merupakan salah satu sektor yang berperan penting dalam memenuhi kebutuhan pangan sekaligus mendukung pertumbuhan ekonomi masyarakat. Pada bidang hortikultura, stroberi termasuk komoditas bernilai ekonomi tinggi yang banyak dibudidayakan, salah satunya di Desa Pancasari, Kabupaten Buleleng. Produktivitas tanaman stroberi dapat menurun akibat serangan berbagai penyakit daun, seperti bercak daun, gosong daun, dan embun tepung. Proses identifikasi penyakit yang masih mengandalkan pengamatan visual memiliki keterbatasan dari segi waktu, akurasi, dan efisiensi, terutama ketika jumlah tanaman yang diamati cukup banyak. Berdasarkan kondisi tersebut, penelitian ini bertujuan membandingkan performa arsitektur *MobileNetV2* dan *ResNet-50* dalam mengklasifikasikan penyakit daun stroberi. Dataset yang digunakan terdiri atas 400 citra daun stroberi yang diperoleh melalui pengambilan data secara langsung di Desa Pancasari dan dikelompokkan ke dalam empat kelas, yaitu bercak daun, gosong daun, embun tepung, dan daun sehat. Kedua arsitektur dikembangkan menggunakan pendekatan *transfer learning* dengan memanfaatkan model *pre-trained ImageNet*. Proses pelatihan dilakukan melalui empat kombinasi *hyperparameter*, yaitu *learning rate* 0.0001 dan 0.00001 serta *batch size* 16 dan 32, dengan jumlah *epoch* maksimum sebanyak 50. Hasil penelitian menunjukkan bahwa konfigurasi terbaik *MobileNetV2* diperoleh pada *learning rate* 0.0001 dan *batch size* 16 dengan akurasi *training* 94%, akurasi validasi 95%, akurasi pengujian 93%, dan *average AUC* 0.996. Sementara itu, konfigurasi terbaik *ResNet-50* menggunakan *learning rate* 0.0001 dan *batch size* 32, dengan akurasi *training* 99%, akurasi validasi 96%, akurasi pengujian 99%, serta *average AUC* 1.000. Berdasarkan hasil tersebut, *ResNet-50* memberikan performa klasifikasi yang lebih baik dibandingkan *MobileNetV2*. Model dengan performa terbaik selanjutnya diimplementasikan ke dalam aplikasi berbasis web menggunakan *Streamlit* sehingga proses klasifikasi penyakit daun stroberi dapat dilakukan secara lebih cepat dan praktis.

Kata Kunci: Penyakit daun stroberi, Deep Learning, Klasifikasi citra, MobileNetV2, ResNet-50

**COMPARISON OF MOBILENETV2 AND RESNET-50 ARCHITECTURE
MODELS FOR STRAWBERRY LEAF DISEASE CLASSIFICATION IN
PANCASARI VILLAGE**

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ABSTRACT

Agriculture is one of the essential sectors that contributes to food security and supports economic growth. In the horticultural sector, strawberries are considered a high-value commodity and are widely cultivated, including in Pancasari Village, Buleleng Regency. However, strawberry productivity can decline due to leaf diseases such as leaf spot, leaf scorch, and powdery mildew. Conventional disease identification through visual observation has limitations in terms of time, accuracy, and efficiency, particularly when a large number of plants must be inspected. Therefore, this study aims to compare the performance of the MobileNetV2 and ResNet-50 architectures for strawberry leaf disease classification. The dataset consisted of 400 strawberry leaf images collected directly from Pancasari Village and categorized into four classes: leaf spot, leaf scorch, powdery mildew, and healthy leaves. Both architectures were developed using a transfer learning approach with a pre-trained ImageNet model. The training process employed four combinations of hyperparameters, consisting of learning rates of 0.0001 and 0.00001 and batch sizes of 16 and 32, with a maximum of 50 epochs. The experimental results showed that the best configuration of MobileNetV2 was achieved using a learning rate of 0.0001 and a batch size of 16, resulting in a training accuracy of 94%, validation accuracy of 95%, testing accuracy of 93%, and an average AUC of 0.996. Meanwhile, the best ResNet-50 configuration used a learning rate of 0.0001 and a batch size of 32, achieving a training accuracy of 99%, validation accuracy of 96%, testing accuracy of 99%, and an average AUC of 1.000. These findings indicate that ResNet-50 outperformed MobileNetV2 in classifying strawberry leaf diseases. The best-performing model was subsequently deployed in a web-based application using Streamlit, enabling a faster and more practical disease classification process.

Keywords: *Strawberry leaf disease, Deep Learning, Image classification, MobileNetV2, ResNet-50*