
Klasifikasi Penyakit Daun Tanaman Tebu Menggunakan RegNet yang Ditingkatkan

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Abstract

Sugarcane is an important agricultural commodity in Indonesia economy, serving as the main raw material for sugar production. Therefore, it is crucial for farmers to perform early disease classification on sugarcane plants to maintain both the quality and quantity of sugarcane production. One approach to achieve this is by utilizing deep learning algorithms to automatically analyze plant images for disease classification. In this study, we propose a modified RegNet architecture, where a dropout layer is incorporated within the block structure, and the activation function in the Squeeze-and-Excitation (SE) layer is changed from ReLU to LeakyReLU. These modifications aim to enhance model performance by preventing overfitting and mitigating "dying ReLU" problem where the ReLU activation function causes neurons to become inactive and stop learning. The dataset consists of 6,784 images representing 11 different classes of healthy and diseased leaves. The results demonstrate that the proposed model outperforms the original model and other comparison models, including EfficientNetB0, MobileNetV3 Large, ResNet18, and EfficientNetV2 Small, across all metrics, achieving an accuracy of 96.98%, precision of 97.17%, recall of 96.98%, and an F1-score of 97.01%, while maintaining a similar model complexity to the original and a far smaller model complexity compared to the other comparison models.

Keywords: Sugarcane Leaf Diseases, RegNet, modified RegNet, image classification
