
Abstract

This study proposes an enhanced EfficientNet-B7 model for the classification of cassava leaf diseases by integrating the Convolutional Block Attention Module (CBAM) and Squeeze-and-Excitation (SE) attention mechanisms. The model was trained on a Kaggle dataset consisting of 21,397 labeled images across five categories: Cassava Brown Streak Disease (CBSD), Cassava Green Mottle (CGM), Cassava Bacterial Blight (CBB), Cassava Mosaic Disease (CMD), and healthy leaves. The results showed that all model configurations achieved an accuracy of 80%, with the CBAM model outperforming others, achieving the highest F1-score of 81%. Despite challenges in classifying CGM due to its similarity to CMD, attention mechanisms improved feature representation, reduced misclassification, and enhanced model robustness. The research also highlighted the effectiveness of attention mechanisms in stabilizing training and improving classification accuracy, suggesting that future work could incorporate advanced segmentation techniques and multi-task learning to further improve performance, particularly for challenging diseases like CGM.

Keywords: EfficientNet-B7, CBAM, Squeeze-and-Excitation, Cassava Leaf Disease, Plant Disease Classification.
