

ABSTRACT

Potato leaf diseases are one of the main factors that reduce the quality and productivity of potato crops. The manual disease identification process is often time-consuming, labor-intensive, and depends on the experience of farmers. This study aims to analyze and compare the performance of several Convolutional Neural Network (CNN) architectures, namely Custom CNN, MobileNetV2, and NASNetMobile, in their implementation on an Android-based system for potato leaf disease classification. The dataset used consists of 2,500 potato leaf images with five classes: healthy leaves, dry spots, leaf blight, potato cyst nematodes, and potato viruses. The results showed that MobileNetV2 had the best performance with an accuracy of 96.6%, a precision of 96.67%, a recall of 96.6%, and an f1-score of 96.6%. In addition, MobileNetV2 also showed the fastest inference time of 63.5 ms with a model size of 2.71 MB, and the best generalization ability with an accuracy of 80% in uncontrolled environment data testing. Based on these results, MobileNetV2 is considered the most optimal CNN architecture for the implementation of Android-based potato leaf disease classification because it is able to provide the best balance between accuracy, computational efficiency, and model generalization capabilities.

Keywords : *Convolutional Neural Network (CNN), MobileNetV2, Custom CNN, NASNetMobile, potato leaf disease*