ABSTRACT

Rice is a staple food consumed by more than half of the world's population, yet its production and quality are threatened by rice plant diseases. Plant diseases can cause significant yield reductions globally. Early identification of rice plant diseases is essential to prevent economic losses and increase rice productivity, but traditional methods of disease detection are often subjective and time-consuming. One solution to the problem is the application of the Convolutional Neural Network (CNN) algorithm. CNN is considered capable of classifying images efficiently, but CNN requires a large number of datasets. This study uses transfer learning method with pre-trained VGG-16 model to overcome the problem of dataset limitation. Transfer learning leverages a model trained on large datasets. VGG-16 is a widely used pre-trained model due to its proven ability in detecting plant diseases. This study classified four categories of rice diseases, namely bacterial leaf blight disease, blast disease, brown spot disease, and false smut disease. The results demonstrate that the VGG-16 model achieves a training data accuracy of 95.42% and a test data accuracy of 97.5%, indicating that the model is capable to classify rice plant diseases without overfitting.

Keywords: Convolutional Neural Network, Rice Plant Diseases, Transfer Learning, VGG-16.