

## ABSTRACT

*Leaf diseases on grape plants, such as Black Rot, Esca, Leaf Blight and Healthy. This disease is generally caused by fungi and bacteria. To identify this disease visually is quite difficult because of the similarity in texture and color between healthy leaves and infected leaves. In this research, a machine learning-based grape leaf disease classification system was created which is expected to provide great benefits in the agricultural sector. This system is designed to identify diseases quickly and accurately. In addition, this system is expected to have the potential to reduce losses due to plant diseases. Machine learning-based grape leaf disease classification method using ResNet50 Convolutional Neural Network (CNN) architecture and transfer learning techniques*

*The model training process is carried out by dividing the datasets into train data, validation data, and test data. Validation data is used to ensure that the model is able to generalize on new data, while test data are used for final evaluation. The implementation of this system is a mobile application that involves using TensorFlow to process leaf images taken using camera or gallery features, so this application can be used practically in the field.*

*The system showed that most images can be classified with the test results involving 4 scenarios, each with a different amount of train data. In the first scenario, using 200 images yields an accuracy of 86.67%. The second scenario with 150 images achieves an accuracy of 85%.*

**Keywords:** *grapevine, machine learning, convolutional neural network, ResNet50*