# ABSTRACT

Grapes are fruit in the form of vines belonging to the vitacae family that live in the lowlands. In the last 5 years from 2016 to 2021, grape production in Indonesia has increased every year, which has had a positive impact on the economy of grape farmers. The causes of good and bad quality of grapes are fungi and pests that stick to grape plants. If not prevented and treated, this will cause a decrease in the quality of the taste of the grapes and can result in crop failure. One of the diseases of grape plants is disease of grape leaves. This disease of grape plant leaves can be seen with the naked eye, but has almost the same similarities, so it is difficult to distinguish from the color and texture of the leaves. Therefore, in this research, a system was created that can detect and classify diseases on grape plant leaves automatically.

This research designs an automatic system used to classify grape leaf diseases using a Convolutional Neural Network with MobileNet architecture. The stages of this research begin by entering the grape leaf image and then carrying out preprocessing, then the results of the preprocessing process are carried out by training the optimizer and the final stage is to classify the image data into 4 classes consisting of health, *black rot*, *black measles* and isariopsis leaf spot. The preprocessing used is CLAHE, Gaussian filter and the Optimizer used is SGD and Adam.

The final results of this research show that the best optimizer is the Adam optimizer using CLAHE preprocessing at epoch 50 and a learning rate of 0.001 so that it gets quite good accuracy values, namely train accuracy 98.973% and test accuracy 95.200% with a train loss value of 0.008 and test loss 0.018. Apart from that, the system performance results include an average accuracy of 97.5%, precision 95.5%, recall 95% and F1-score 95.5%.

**Keywords** : Grape, Convolutional Neural Network (CNN), MobileNet, Leaf Disease , Image of Grape Leaves.