

ABSTRACT

Rice plant is one of the important factors in supporting human life. Humans carry out rice farming activities to produce rice which will later become a staple food for humans. When it starts to grow, of course, rice plants also often face problems such as pests or diseases that cause plants to die and lead to crop failure. So proper handling is needed to overcome the disease in rice plants. One of the treatments that can be done is by detecting diseases that exist in rice plants, so that farmers can provide appropriate treatment for these problems.

In this final project, a rice disease detection system has been designed using digital image processing with the Convolutional Neural Network (CNN) method. The data will be processed through several stages, then the datasets used in this final project are three classes of rice plant diseases, such as bacterial leaf blight, brown spot, leaf smut and one class of healthy rice plants with a total of 16000 datasets collected from *www.kaggle.net* and previous research.

The parameters tested in this study, namely the hidden layer, optimizer, learning rate, number of epochs, input size, and batch size affect system performance in the form of accuracy, precision, recall, fl-score, and loss values. In this study, the best results were obtained using the four hidden layer, Adam optimizer, learning rate 0,0001, number of epochs 100, input size 64x64, and batch size 32. The results obtained system performance with values of accuracy, precision, recall, fl-score, and loss respectively. Of 99,66%, 100%, 100%, 100%, and 0,0047, as well as a good fit performance graph of accuracy and loss.

Keywords: *Rice plant, digital image processing, Convolutional Neural Network, system performance*