ABSTRACT

Rice plants is one of the most important cultivated plants in the world. Many countries in the world, especially in Asia, make rice production as a daily staple food, including in Indonesia. Healthy rice plants will produce rice with good quality and quantity. However, there are many factors that can hinder the rice production, one of it is the presence of disease in rice plants. The disease in rice plants could attack all parts of the plant, including leaves, stems and grain. If treatment is not given immediately, the plants can wither and even die before they can be harvested, even the diseased rice plants which could survive until the harvest period also cannot produce good quality of rice.

In this Final Project research, a system that is able to classify diseases in rice plants were made using a Convolutional Neural Network (CNN) with a Softmax activation function. CNN uses images as input data and processed through several stages. There are three classes of diseases in rice plants that the researcher used as image data and obtained from www.kaggle.com. The three classes of diseases are bacterial leaf blight, brown spot and leaf smut, where each class consists of 4000 images data.

Parameters such as the number of hidden layers, optimizer and learning rate are observed as the influence of system performance results in the form of accuracy, precision, recall, f1 score and loss values. In this study, best results were obtained by using 5 hidden layers, RMSprop optimizer and learning rate 0.0001. The results of system performance for accuracy, precision, recall, f1-score and loss for each are 99.77%, 100%, 100%, 100% and 0.0039.

Keywords: Rice plants, image processing, Convolutional Neural Network, system performance.