ABSTRACT

Corn plants grow well in hot and cold areas with sufficient rainfall and irrigation. However, during one life cycle from seed to seed, every part of corn is susceptible to a number of diseases, which can reduce the quantity and quality of yields. Because of that disease problem, seed production and quality are limited. This final project will discuss the design of a corn plant disease detection system using the convolutional neural network (CNN) method and Alexnet architecture to classify it. The data will be processed in several stages. The dataset used in this final project research consisted of three classes of maize plant diseases, namely, Hawar Daun, Karat Daun, and gray leaf spot, and one type of Sehat Daun plant, for a total of 4188 datasets. The dataset can be accessed at Kaggle website.

The parameters tested in this study, namely optimizer, learning rate, number of epoch, 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 SGD optimizer with a learning rate of 0.01, a number of epoch of 20, input size of 128x128, and batch size of 32. System performance results were obtained with values for accuracy, precision, recall, fl-score, and loss, respectively, of 89%, 87%, 85%, 85%, and 0.2852, as well as graphs of good fit accuracy and loss performance.

Keywords: Corn plant disease, Convolutional neural network, Alexnet. Digital image processing, Accuracy.