ABSTRACT

The Sars-Cov-2 virus is a virus that causes pneumonia, also known as Covid-19. This disease interferes lungs which causes respiratory organs being disrupted and the oxygen exchange process cannot run properly. It is very difficult to be able to distinguish who has been positively affected by Covid-19 and not because the symptoms suffered are very common. Moreover, because of the Viral Pneumonia which has almost the same symptoms as Covid-19 even the X-Ray results can be said to be very difficult to distinguish with the naked eye. Currently the most accurate diagnostic result is to do a chest X-ray and get an X-Ray of the patient's lungs, but in detecting the X-Ray results doctors usually still doing it manually. With the increasing number of sufferers from Covid-19 from time to time, it will take a lot of time and it is also possible that the prediction results could be wrong.

This final project research aims to create a system that can be used to detect the spread of Covid-19 through X-Ray results with a shorter, more accurate, effective and efficient method using the Contrast Limited Adaptive Histogram Equalization (CLAHE) method and also the Convolutional method. Neural Networks (CNN).

In this study, the dataset used was obtained from the COVID-19_Radiography_Dataset with a total data of 8,575 X-Ray images of lungs diseases which are divided into three classes. In the trial process, the data is further divided into 75% training data and 25% as test data. The CNN architecture used in this research is the AlexNet architecture. Then several test scenarios were also carried out to find the best hyperparameters. When using the original dataset, the best hyperparameter results obtained were epoch 50, learning rate 0.001, batch size 32 and optimizer adamax. The accuracy obtained when using this best hyperparameters gets an accuracy of 91.11% and a loss value of 3.0645. Then the results after pre-processing using CLAHE first, the best hyperparameter values obtained are epoch 50, learning rate 0.0001, batch size 64 and optimizer adamax. The accuracy obtained when using this best hyperparameter is 89.39% with a loss of 0.5252.

Keywords: Covid-19, *Contrast Limited Adaptive Histogram Equalization* (CLAHE), *Convolutional Neural Network* (CNN), *AlexNet*