ABSTRACT

As we know Pneumonia is basically caused by viruses and bacteria, one of which is called Mycobacterium, namely bacteria (the cause of pulmonary TB). According to data from the World Health Organization (WHO), TB or tuberculosis is one of the top 10 causes of death worldwide. In addition, there is a new disease variant that we are facing around the world now, namely COVID-19 which can trigger pneumonia. The symptoms faced are almost exactly the same as the symptoms of pneumonia and tuberculosis such as fever, shortness of breath and chronic attacks.

The process of detecting the presence of COVID19, pneumonia, tuberculosis is carried out by manual observation by a doctor, so it is prone to human error. Therefore, several solutions have been developed to overcome the problem of diagnosing COVID-19, pneumonia, and tuberculosis, including using a chest X-ray image processing method as well as using a programming language and producing valid software for diagnosis and classifying the three. the disease. One of them is by using Convolutional neural network (CNN) which is one of the algorithms of deep learning.

The system is designed using the CNN method with the Alexnet architecture based on a chest X-ray image as its input. The input image used in this study is a dataset taken from Kaggle with the name Chest X-Ray (Pneumonia, Covid-19, Tuberculosis) with a total dataset used of 2304 where 75% of the images are train data and 25% are test data images. The best results obtained for each test scenario are using Adam's Optimizer, Resize 64x64 pixel, Learning Rate 0.0001, Epoch 35, Batch Size 16 with 95% Accuracy and 0.161 Loss.

Keywords: *Convolutional Neural Network* (CNN), Alexnet, COVID-19, *Pneumonia, Tuberculosis*.