ABSTRACT

One of the most important organs in the human body in the respiratory system is the lungs. The function of the lungs is to pump air into the body. Tuberculosis or commonly known as TB is a disease that attacks the lungs and is caused by mycobacterium tuberculosis, a type of bacteria that is resistant to acidic conditions. To prevent and treat lung disease, an x-ray or X-ray examination can be done. The results of a chest x-ray examination are very helpful for doctors in diagnosing disease in patients. If the doctor has doubts about the diagnosis after seeing the results of the chest x-ray, a method is needed that can help convince the doctor in identifying the disease based on the results of the chest x-ray, thereby facilitating the diagnosis process. This study uses a deep learning algorithm, namely the Convolutional Neural Network (CNN) for image recognition on chest x-rays with a convolution process that divides the image into smaller images using seven convolution layers. The system will be trained using a chest x-ray image dataset of the lungs with two data classes, namely Normal and Tuberculosis with a total of 4200 images. Testing the data using cross validation, namely 70% of the data as training, 10% of the data as validation and 20% of the data as testing. then analyzed using the confusion matrix. In the process of training and testing the model, there are several parameters used for comparison, namely batch size and type of pooling layer to achieve the best accuracy results. The best average results are obtained when using batch size 64 and max pooling with accuracy, recall and F1-Score reaching 99.28% so as to produce accurate predictions.

Keywords: *Batch size, Convolutional Neural Network, Deep Learning, Classification, Tuberculosis.*