

## **ABSTRACT**

Tuberculosis is a dangerous infectious disease, because it can cause death. Tuberculosis is an infectious disease due to infection with the Mycobacterium tuberculosis bacteria that attacks the lungs. Tuberculosis must be treated seriously because otherwise it will be fatal. Currently detecting tuberculosis is still being processed manually by medical personnel, which results in differences in readings between medical observers and reader fatigue. This problem can be prevented by another alternative, namely by determining the identification of tuberculosis using a computer-based image system. One of the methods used in computer-based image processing systems to detect tuberculosis is Convolutional Neural Network (CNN).

Convolutional Neural Network (CNN) has significant results in recognizing images. This final project uses a chest x-ray dataset whose testing process uses 2 classes, namely normal and tuberculosis. This study uses the VGG-16 architecture which consists of 16 layers, including 13 convolutional layers and 3 fully connected layers. The System is designed using the Google Colab platform with Python programming language and the dataset is obtained from kaggle

In this final project, the test uses 5 scenarios, namely testing on the input image size, optimizer, learning rate, batch size, and epoch. The dataset used in this study amounted to 1400 images. The best parameters obtained from testing the scenario are using input size  $128 \times 128$ , SGD optimizer, learning rate 0.01, batch size 16, and epoch 50. The results obtained from the best parameters are the accuracy value of 98.57%, loss value of 0.0356, value of precision, recall, and f1 score of 98.5%.

**Keywords:** Chest x-ray, CNN, Normal, Tuberculosis, VGG-16.