# ABSTRACT

*Pneumonia is an infection that causes inflammation of the air sacs in one or both lungs which is usually caused by bacteria, viruses, or fungi. To detect pneumonia, you can use an X-Ray or CT scan. But often used is X-Ray because it is more affordable. X-Ray also has drawbacks, namely the difficulty of detecting the disease. So to diagnose it takes a long time. This pneumonia disease has been widely studied using the CNN-ELM, SVM, KNN methods, and obtained an accuracy of 93.59% and 80.77% for CNN-ELM, 62.66% and 59.2% for SVm, 91.15% and 93.63% for KNN.*

*This final task aims to design and compare the performance of the system to be able to classify pneumonia. In this study the classification was divided into 3 classes, namely bacterial pneumonia, viral pneumonia, and normal lungs. The dataset used is an Chest X-Ray from Paul Mooney which can be accessed via the Kaggle website which contains 5857 images, but in this study only use 3000 images, of which 1000 are for normal data, 1000 for bacterial pneumonia, and 1000 for viral pneumonia.*

*In this study, image processing uses the Convolutional Neural Network (CNN) method. This research will also use an optimizer, Adaptive Momentum (Adam), Root Mean Square Propagation (RMSProp), Maximum Adaptive Moment Estimation (AdaMax), dan Nesterov-Accelerated Adaptive Moment Estimation (Nadam). This research is expected to achieve good accuracy so that it can be used effectively. The final result of this study shows that the best model is Adam's optimizer using a learning rate 0.0001, batch size 8, and epoch 100 with 100% training data accuracy and 89,67% test data accuracy.*

***Keyword** : Adaptive Momentum (Adam), Maximum Adaptive Moment Estimation (AdaMax), Chest X-Ray, Convolution Neural Network (CNN), Pneumonia, Nesterov-Accelerated Adaptive Moment Estimation (Nadam), Root Mean Square Propagation (RMSProp).*