ABSTRACT

Emphysema is a condition in which the walls of the air sacs or alveoli of the lungs are damaged which makes it difficult for a person to breathe. One of the medical measures to determine this condition is to look at the patient's chest X-ray images manually, but the human sense of sight has limitations in identifying large amounts of lung X-rays and requires a long time. To reduce the risk of misdiagnosing lung disease, deep learning algorithms are applied. The use of the Densenet121 architecture CNN computed method makes it easier for experts to recognize and classify emphysema chest x-ray image data. The Densenet121 architecture CNN method was tested by varying the optimizer and learning rate. This study examined a of 4840 lung x-ray images consisting of emphysema disease and normal lungs. The results of the trials found that the Densenet121 architecture was able to identify emphysema accurately with the Adam optimizer at a learning rate of 0.001 and obtained an accuracy of 98.76%, a precision of 98.9%, and a recall of 98.5%.

Keywords: *Emphysema, CNN, Chest x-ray, DenseNet121, Deep learning*.