ABSTRACT

Pneumonia is a serious lung disease that accounts for 14% of deaths among children under the age of 5, with the death toll reaching approximately 740,180 according to WHO data in 2019. Manual identification of pneumonia lesions on X-ray images can take from several minutes to over an hour per image, thus delaying prompt medical intervention. This study aims to develop a deep learning model using the U-Net architecture that can quickly and accurately segment images to automate the identification of pneumonia lesions on X-ray images, thereby improving the efficiency and accuracy of diagnosis and medical treatment. The U-Net model is trained using a dataset of X-ray images annotated by radiology experts. The image pixel size used is 64 x 64 to ensure consistency in data processing. The model was trained with two different data sets: one set consisting of 20 images over 10 epochs, and the other set consisting of 118 images over 50 epochs. The training results show that a larger dataset and more epochs produce a more accurate model. The trained U-Net model demonstrated good performance with a test loss of 0.6798, a test accuracy of 78.12%, a test precision of 70%, and a test recall of 93.33%. U-Net can accurately identify positive pneumonia cases, thus enhancing the diagnostic process and aiding doctors in providing faster and more accurate treatment. The use of U-Net in identifying pneumonia lesions on X-ray images offers a quick and accurate automated solution, supporting medical personnel in delivering more effective and efficient care..

***Keywords**: Pneumonia, Image Segmentation, U-Net, Deep learning, Model Accuracy.*