Leveraging Convolutional Neural Networks for Automated Pneumonia Detection in Chest X-rays using Python

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Abstract

Pneumonia is a lung illness caused by bacteria, viruses, or fungus, which causes inflammation and fluid buildup in the air sacs, preventing breathing. Chest X-rays are typically used to diagnose pneumonia; this process requires skilled interpretation and can be time-consuming, depending on the radiologist's ability. This study investigates automating the identification of pneumonia from a dataset of Chest X-ray images using Convolutional Neural Networks. The CNN model can reliably differentiate between patients who are healthy and those who have pneumonia since it was trained on a large amount of Chest X-ray images dataset from Kaggle. The CNN model provides better accuracy, dependability, and speed by processing a large number of images more quickly than a human doctor. This study highlights how CNNs can assist healthcare professionals by providing a faster, more accessible, and accurate diagnostic tool for detecting pneumonia. Due to its scalability and ability to process large datasets, the model can be implemented in various healthcare environments, enhancing patient outcomes and alleviating the burden on medical professionals.

Keywords: *Pneumonia detection, Deep Learning, CNN, Chest X-ray images, Automated diagnosis.*