

## A Comparative Study on Deep Learning Models for Pneumonia Detection

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**Abstract :** Pneumonia, being a respiratory infection, has garnered global attention due to its rapid transmission and relatively high mortality rates. Timely detection and treatment play a crucial role in significantly reducing mortality associated with pneumonia. Presently, X-ray diagnosis stands out as a reasonably effective method. However, the manual scrutiny of a patient's X-ray chest radiograph by a proficient practitioner usually requires 5 to 15 minutes. In situations where cases are concentrated, this places immense pressure on clinicians for timely diagnosis. Relying solely on the visual acumen of imaging doctors proves to be inefficient, particularly given the low speed of manual analysis. Therefore, the integration of artificial intelligence into the clinical image diagnosis of pneumonia becomes imperative. Additionally, AI recognition is notably rapid, with convolutional neural networks (CNNs) demonstrating superior performance compared to human counterparts in image identification tasks. To conduct our study, we utilized a dataset comprising chest X-ray images obtained from Kaggle, encompassing a total of 5216 training images and 624 test images, categorized into two classes: normal and pneumonia. Employing five mainstream network algorithms, we undertook a comprehensive analysis to classify these diseases within the dataset, subsequently comparing the results. The integration of artificial intelligence, particularly through improved network architectures, stands as a transformative step towards more efficient and accurate clinical diagnoses across various medical domains.

**Keywords :** deep learning, computer vision, pneumonia, models, comparative study

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