

Lung Disease Detection Using Deep Learning

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Abstract: *The rapid and accurate diagnosis of lung disease is essential for effective patient management and controlling the spread of the virus. Traditional deep learning models, including Convolution Neural Networks (CNNs) and Vision Transformers (ViTs), have demonstrated promising results in medical image classification. However, these models often suffer from high computational costs and lack hierarchical feature learning. In this study, we propose a Swin Transformer-Based Deep learning Model for lung disease detection using chest X-ray images. The Swin Transformer introduces a shifted window mechanism that enables efficient feature extraction while maintaining global context awareness. Our method is evaluated on benchmark lung disease X-ray datasets, comparing its performance with conventional CNNs and standard ViT models. Experimental results demonstrate that the Swin Transformer achieves superior accuracy, robustness, and computational efficiency, making it a viable alternative for real-world deployment in clinical settings. Furthermore, we enhance interpretability by leveraging explainable AI (XAI) techniques to provide insights into the model's decision-making process. The proposed approach presents a scalable and effective solution for automated lung disease diagnosis, contributing to improved diagnostic workflows in healthcare applications*

Keywords: Swin Transformer, lung disease diagnosis, Chest X-ray, Deep Learning, Medical Imaging, Vision Transformer, Explainable AI

