

Lung Disease Prediction Using Machine Learning Algorithms And GAN

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Abstract: Lung diseases, particularly lung cancer, pose a significant global health challenge, ranking among the leading causes of death worldwide. Early and accurate detection is critical for improving patient survival and treatment outcomes. Deep learning techniques, especially convolutional neural networks (CNNs), have shown remarkable success in automating lung disease detection from medical images. However, their performance typically depends on access to large, well-annotated datasets, which are often limited in clinical settings. In this study, we propose a deep learning-based classification framework, Lung-GAN, which combines generative adversarial networks (GANs) with CNNs to enhance detection accuracy of lung cancer using chest CT and X-ray images. Our approach utilizes GANs to generate high-quality synthetic images that augment the training dataset, improving model generalization. We focus specifically on classifying four categories: large cell carcinoma, adenocarcinoma, squamous cell carcinoma, and normal lung tissue. Experimental results show that our framework achieves superior classification performance compared to existing models, even with limited labeled data. This method has the potential to support early diagnosis, reduce radiologist workload, and improve clinical decision-making in lung cancer care

Keywords: Lung cancer, CT scan, X-ray, Adenocarcinoma, Large cell carcinoma, Squamous cell carcinoma, Deep learning, Generative adversarial networks, Labeled data augmentation.

