Automated Detection of Pulmonary Fibrosis Using Transfer Learning Models

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Abstract

Pulmonary Fibrosis which is a chronic lung disease demands prompt diagnosis for effective management. This project develops an automated system using deep learning for feature extraction and machine learning for classification, reducing reliance on manual assessments. In this context, we use InceptionV3 for feature extraction, VGG19 for feature extraction, and MobileNetV2 for feature extraction as they are constantly successful and able to detect fine-grained patterns from medical images. The extracted features are further analyzed with popular machine learning techniques including but not limited to Random Forest and SVM. This has been such a break through because the new hybrid model, leads to a faster diagnosis even if it is comparatively more accurate, than the previously used models. The system's performance is evaluated using accuracy, precision, recall, and F1-score. Integrated into a Flask-based web application, it enables quick and accurate Pulmonary Fibrosis diagnosis, aiding timely treatment and better patient outcomes.

Keywords

Pulmonary Fibrosis, Diagnosis, Deep Learning Machine Learning, CT Scan, Feature Extraction, Web Application.