A Role of Machine Learning Algorithms for Lung Disease Prediction and Analysis

Vishal Borate[1], Dr. Alpana Adsul[2], Palak Purohit[3],
Rucha Sambare[4], Samiksha Yadav[5], Arya Zunjarrao[6]
Assistant Professor, Department of Computer Engineering[1]
Associate Professor, Department of Computer Engineering[2]
Students, Department of Computer Engineering[3,4,5,6]
Dr. D. Y. Patil College of Engineering & Innovation Talegaon, Pune, India

Abstract: *Lung diseases are a notable in global health concern, requiring early diagnosis for better recovery and survival rates. Deep learning strategies, especially CNNs, have shown great promise in self learning lung disease diagnosis from medical images like chest X-rays. Ensemble learning methods using pretrained networks such as VGG16, InceptionV3, and MobileNetV2 have achieved up to 94% accuracy in identifying conditions like COVID-19, pneumonia, and lung opacity. Lightweight CNN models also performed well, with accuracy up to 89.89%. Traditional machine learning algorithms, including Random Forest and Logistic Regression, yielded accuracy rates between 88% and 90%. A hybrid deep learning approach, combining CNN based feature extraction with classifiers like AdaBoost, SVM, and Random Forest, improved classification accuracy by 3.1% and reduced computational complexity by 16.91%. This hybrid method highlights the main feature for integrating deep learning with traditional classifiers to enhance lung disease detection efficiency*

Keywords: Deep learning, Convolutional neural networks (CNNs), Semi-Supervised models, Chest CT images, Classification, Accuracy