NARASARAOPETA ENGINEERING COLLEGE

(AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

2024-2025

BATCH NUMBER	AG1
TEAM MEMBERS	Gurram Siva Anjali (21471A0526) Pandi Jyoshna Devi (21471A0542) Gude Lavanya (21471A0524)
GUIDE	Dr. K. LakshmiNadh
TITLE	Unveiling the Potential of Deep Learning: A Multifaceted Approach to Pulmonary Disease Detection and Clinical Integration
DOMAIN/TECHNOLOGY	DEEP LEARNING
BASE PAPER LINK	https://doi.org/10.1186/s12880-024-01227-2
DATASET LINK	https://www.kaggle.com/code/subratasarkar32/using-cnn-detect-pulmonary-disease-in-xray, https://www.kaggle.com/code/shibsankargiri200113/lungdiseasedetection2-0, https://www.kaggle.com/code/faressayah/chest-x-ray-medical-diagnosis-with-cnn-densenet, https://www.kaggle.com/code/mannarmohamedsayed/lung-disease-cnn, https://www.kaggle.com/code/alkidiarete/lung-disease-tensorctscan

SOFTWARE REQUIREMENTS	**Browser:** Any latest browser like Chrome **Operating System:** Windows 10 Server. **Language:** Python
HARDWARE REQUIREMENTS	**Processor:** Intel® Dual Core 2.0GHz minimum **Hard Disk:** 1TB minimum **RAM:** 8GB or more **Cache Memory:**4MB
ABSTRACT	Pulmonary diseases are major challenges in healthcare basically because of the complexities of diagnosing and treating them. However, deep learning technology has shown that enhancing disease detection and integrating these technologies within healthcare environments is possible. This project aims to improve the accuracy of pulmonary disease diagnosis focusing on viral pneumonitis, bacterial pneumonitis, COVID-19, and normal lung conditions through deep learning models. Our models leverage sophisticated, specifically developed CNNs that identify subtle patterns and differences indicative of these diseases from a variety of clinical imaging modalities, including chest radiographs and computed tomography scans. In addition, the project explores ways of incorporating such AI-based ways into present-day clinical practice so that we can shift from traditional methods towards those informed by AI. During this research work among different groups of patients, we have conducted rigorous tests on our models against established diagnostic standards. The findings show significant changes in early detection and significantly reduced diagnostic error rates which emphasize the disruptive ability of deep learning to pulmonary disease management. It also discusses ethical and practical challenges in the use of AI in healthcare, particularly in ensuring patient privacy, making AI-driven decisions transparent, and the need for education and training of healthcare professionals. This work emphasizes the potential that deep learning possesses in revolutionizing the detection of pulmonary diseases and paves the way for its wide application in clinical practice.