

	Dr D Y Patil Pratishthan's Dr. D.Y. Patil Institute of Engineering, Management and Research, Akurdi, Pune	
Academic Year: 2023-24	Seminar & Technical Communication Synopsis	
Term – II	Department: Artificial Intelligence and Data Science (Honors in Data Science)	Date of Preparation: 11/03/2024

Roll No	BEAD20140	Division	-
Domain Name	Machine Learning and Deep Learning		
Seminar Title	Pneumonia Detection and Classification using Deep Learning		
Student Name	Anup Muttha		
Guide Name	Mrs. Manisha Khadase		

Abstract:

Pneumonia, an infectious disease caused by bacteria in the lungs, can be diagnosed through various methods such as chest X-rays, ultrasounds, or lung biopsies. Misdiagnosis can lead to delayed treatment and poor patient outcomes. Deep learning, particularly using Convolutional Neural Networks (CNNs), has shown promise in aiding medical professionals in diagnosing pneumonia from chest X-ray images. A study utilized an accumulated dataset of 20,000 images with a resolution of 224x224 pixels and a batch size of 32 to train a CNN model. The trained model achieved an accuracy rate of 95% at the end of training, indicating its effectiveness in distinguishing between healthy and pneumonia-affected individuals based on chest X-ray images. This research suggests that deep learning models can be a valuable tool for detecting and diagnosing pneumonia, potentially improving patient care and outcomes.


Briefs about Contents:

Objective:

This project aims to employ Deep Learning, specifically Convolutional Neural Networks, to improve pneumonia detection accuracy from chest X-ray images. It involves learning biomedical terms, understanding pneumonia scenarios, exploring data acquisition methods, and developing a user-friendly web application for efficient diagnosis.

Advantages:

1. **Enhanced Accuracy:** Deep learning models offer high accuracy in pneumonia detection, aiding in precise diagnosis.
2. **Automation:** AI-driven automation reduces the manual workload for healthcare professionals, potentially expediting diagnosis.

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3. Scalability: Deep learning models efficiently handle large datasets, allowing for scalability with increasing medical imaging data.
4. Accessibility: A user-friendly web application makes pneumonia diagnosis accessible to a broader audience, potentially improving healthcare accessibility globally.

Disadvantages:

1. Data Quality Dependency
2. Interpretability Challenges
3. Resource Intensiveness
4. Ethical Concerns

Applications areas:

1. Medical Diagnosis
2. Telemedicine
3. Public Health Screening
4. Clinical Research

Conclusion:

Leveraging Deep Learning models, particularly Convolutional Neural Networks, for pneumonia detection from chest X-ray images offers significant potential benefits in healthcare. By enhancing accuracy, automating diagnosis, and improving accessibility, this technology can aid healthcare professionals in timely and precise decision-making. However, challenges such as data quality dependency, interpretability issues, resource intensiveness, and ethical considerations need to be addressed. Despite these challenges, the promising applications of this technology in medical diagnosis, telemedicine, public health screening, and clinical research highlight its importance in advancing healthcare outcomes. With further research, collaboration, and ethical implementation, Deep Learning-based pneumonia detection holds promise for improving patient care and public health initiatives.