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Lungscan Intelligent Detection of Pulmonary Diseases

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ABSTRACT — With the growing need for faster and more accurate diagnosis in the medical field, especially in radiology, this project introduces a Pneumonia Detection Web Application that helps automate the identification of pneumonia from chest X-ray images. Built using deep learning, the system uses a convolutional neural network (CNN) trained to differentiate between normal and pneumonia-affected lungs. The application allows users—primarily clinicians or radiologists—to upload an X-ray image through a clean and responsive interface built with React.js. Once uploaded, the image is sent to a Flask-based backend where it is preprocessed and analyzed by the trained model. The result, indicating whether the image shows signs of pneumonia, is then displayed to the user along with a confidence score. This tool aims to assist healthcare professionals in making quicker and more reliable diagnoses, especially in settings where expert interpretation may not always be available. The system's design focuses on usability, speed, and accuracy, making it a valuable addition to modern diagnostic workflows.

Keywords — Secure communication, End-to-end encryption, User authentication, Real-time messaging.

I. INTRODUCTION

In today's healthcare landscape, fast and accurate diagnosis plays a vital role in improving patient outcomes. Pneumonia, a potentially serious lung infection, is one condition where early detection is critical. Our innovative web application offers a modern approach to diagnosing pneumonia using chest X-ray images and the power of deep learning. This intuitive platform is built to simplify and speed up the diagnostic process—particularly for clinicians and healthcare professionals.

Imagine having a digital assistant that helps identify signs of pneumonia with a high degree of accuracy. Our system guides users through each step of image analysis—from uploading an X-ray to receiving a diagnostic result in real time. The application's clean and responsive interface makes it easy to navigate, even for users who may not be tech-savvy, eliminating the need to worry about complex algorithms or medical jargon.

At its core, the application uses a convolutional neural network (CNN) trained on a labeled chest X-ray dataset. Advanced preprocessing ensures each image is standardized for optimal analysis, and the final prediction is presented clearly along with a confidence score. This transparency allows users to trust and interpret results more easily, aiding in clinical decision-making.

Security and privacy are also top priorities. Patient data is handled responsibly with secure transmission and storage practices, helping institutions comply with healthcare data standards. Our application empowers users by providing support materials—like FAQs and usage guides—to build confidence in both the technology and the results.

II. LITERATURE REVIEW

2.1 " Pneumonia Detection Using Deep Learning Techniques"

This paper presents a professional chat application that uses natural language processing (NLP) to prevent users from sending inappropriate messages. Messages are checked for foul or negative language, and if found inappropriate, they are blocked from being sent.

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2.2 "Ecdh Key Algorithm"

This paper proposes a secure chat application using ECDH for end-to-end encryption, with AES for text messages and RC4 for voice and image messages. The model ensures high security and efficiency for mobile devices.

2.3 "Encryotion Using DES and AES Algorithm "

This paper details an encrypted chat app using DES, AES, and RSA for message security, with future plans for performance testing and image encryption via computer vision.

2.4 "Data Privacy and Security in Medical AI Applications"

This paper discusses methods to ensure the secure handling of medical data in AI-based diagnostic applications. The proposed model incorporates techniques such as encrypted data transmission, secure login authentication, and compliance with healthcare standards like HIPAA and GDPR. It highlights how patient X-ray images and diagnostic results can be protected while still allowing real-time access for clinicians. Security measures include role-based authentication, restricted data sharing, and secure storage systems to prevent unauthorized access.

III. EXSISTING SYSTEM

In the current healthcare system, pneumonia diagnosis primarily depends on radiologists manually interpreting chest X-ray images. While this method is effective, it is time-consuming, requires specialized expertise, and is subject to human error or variation between clinicians. In many rural or resource-limited areas, the shortage of experienced radiologists leads to delayed or missed diagnoses, putting patients at higher risk. Some existing computer-aided diagnostic tools attempt to assist clinicians, but many of them face limitations such as low accuracy, poor adaptability to diverse datasets, and lack of a user-friendly interface for practical clinical use.

IV. PROPOSED SYSTEM

The proposed system is a web-based pneumonia detection application that uses a Convolutional Neural Network (CNN) to analyze chest X-ray images and provide real-time diagnostic results with a confidence score. It features a simple, user-friendly interface for easy image upload and result interpretation, making it suitable for both clinicians and non-technical users. To ensure trust and compliance, the system integrates secure data transmission, encrypted storage, and adherence to healthcare standards, offering an accurate, fast, and reliable tool for modern healthcare environments.

V. EXPERIMENTAL RESULT

FIGURE 5.1 DASHBOARD PAGE

FIGURE 5.2 UPLOAD PAGE

FIGURE 5.3 HISTORY PAG

VI. CONCLUSION

In summary, this project presents a web-based pneumonia detection system designed to assist healthcare professionals in achieving faster and more accurate diagnoses using chest X-ray images. By leveraging deep learning, particularly Convolutional Neural Networks (CNNs), the system provides real-time predictions along with confidence scores, helping clinicians make informed decisions. The application emphasizes ease of use through a clean interface, while also ensuring patient data privacy with secure transmission and storage practices. Looking ahead, the system can be enhanced with larger datasets, multi-disease detection capabilities, and integration into hospital management systems, making it a

valuable and scalable solution for modern healthcare.

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