

**An Integrated Framework for COVID and Pneumonia Disease  
Prediction using Optimized Deep Learning Models**

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## **80\_Recommendations**

As seen in the proposed techniques, numerous efforts have been made to identify diseases at an early stage. However, it is still a tough job to identify fewer, more specific features that can predict disease extremely early. Future work will focus on extraction as well as the study of novel features that are more likely to assist in the recognition of disease. Additionally, features found to be less informative within the proposed framework will be excluded to enhance prediction performance. This would help doctors, physicians, and healthcare professionals make effective decisions for disease diagnosis.

The proposed methods involved applying an optimization technique to adjust the fine-tuning hyperparameters. But, it was unable to select optimal features with lesser error. Future work will extend the proposed techniques by incorporating novel optimization techniques into deep learning (DL) methods for categorizing a variety of data with minimal prediction error by adjusting the hyperparameters. This will enable the proactive recognition of diseases and significantly improve efficiency in the healthcare industry by facilitating faster and more accurate diagnosis.

The proposed techniques were not considered, and the computational cost parameters for disease detection were not estimated. Additionally, the computational cost associated with handling a large number of data samples will be analyzed in the future.

The proposed techniques did not sufficiently address the automatic prediction of patient data, considering higher security. Additionally, the automatic prediction of patient data requires increased security, as patient medical information is highly confidential. Therefore, in the future, security models can be used to build prediction models for securely diagnosing patient data.

The proposed methods lacked consideration of other medical domains, namely pattern recognition and object detection, for precise image classification. This contributing to the improvement of medical diagnostics and patient care. In future work, DL-based pattern recognition and object detection will be utilized. Pattern recognition will be utilized for identifying recurring patterns and features within images. Object recognition will be utilized to find specific objects within an image, such as organs, tumors, or blood vessels. This can be helpful in early disease detection.