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Optimization of Chest X-Ray Analysis for Heart Disease Detection Using Neural Networks

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Abstract:

Early and accurate detection of heart disease is vital for effective treatment and patient prognosis. This research presents a neural network-based approach for optimizing the analysis of chest X-ray images to enhance heart disease detection. The proposed system utilizes convolutional neural networks (CNNs) to automatically extract and learn deep features from chest radiographs, enabling high-accuracy classification of pathological conditions. Optimization techniques, including hyperparameter tuning and data augmentation, are applied to improve model performance and generalization. The system is evaluated using publicly available chest X-ray datasets, showing superior diagnostic accuracy compared to traditional methods. This work highlights the potential of deep learning in facilitating cost-effective, non-invasive, and scalable diagnostic tools for cardiovascular healthcare.

Keywords:

Chest X-ray, heart disease, neural networks, deep learning, medical imaging, optimization.

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