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Cancer Diagnosis Enhancement Using Deep Learning and Neural Networks in Medical Image Bioinformatics

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Abstract:

Accurate and early diagnosis of cancer is vital for effective treatment and patient survival. Recent advances in deep learning and neural network architectures have revolutionized medical image bioinformatics, offering enhanced precision and speed in cancer detection. This study explores the integration of convolutional neural networks (CNNs) and deep learning models for the classification and analysis of medical images, including MRI, CT, and histopathological data. By leveraging high-dimensional image features and learning complex patterns indicative of malignancies, the proposed approach significantly improves diagnostic accuracy compared to traditional methods. Additionally, the application of bioinformatics tools aids in correlating imaging findings with genomic data, supporting personalized medicine initiatives. The study highlights performance metrics across different datasets, demonstrating the model's generalizability and clinical relevance.

Keywords:

Cancer diagnosis, deep learning, neural networks, medical imaging, bioinformatics, image classification

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