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Optimization of Medical Image Analysis for Cancer Diagnosis Using Neural Network Algorithms

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Abstract:

Accurate and early cancer diagnosis is critical for effective treatment planning and improved patient outcomes. This study explores the application of neural network algorithms in optimizing medical image analysis for cancer detection and classification. By leveraging deep learning techniques such as convolutional neural networks (CNNs), the research aims to enhance feature extraction, image segmentation, and tumor classification accuracy in various imaging modalities, including MRI, CT, and histopathology slides. The proposed framework is evaluated on benchmark medical imaging datasets, demonstrating superior performance in terms of sensitivity, specificity, and diagnostic precision. The findings underscore the potential of neural networks in transforming oncological diagnostics by offering automated, scalable, and reliable image interpretation tools.

Keywords:

Cancer diagnosis, medical imaging, neural networks, deep learning, image analysis, diagnostic optimization.

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