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A Unified AI-Based Approach for Processing Heterogeneous Medical Data in Healthcare Informatics

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Abstract: *The exponential growth of digital healthcare data from imaging and clinical records to sensor and genomic sources has created both a vast opportunity and a technical challenge. Artificial Intelligence (AI) provides a promising means to interpret this diversity of information and to generate clinically useful insights. This research proposes a unified, multimodal framework that integrates deep learning and machine learning techniques for processing heterogeneous medical data. The focus lies on diagnostic prediction, image interpretation, patient risk estimation, and clinical text analysis. The study aims to benchmark multiple learning strategies in terms of predictive accuracy, interpretability, and adaptability across datasets. The expected contribution includes a modular AI pipeline and ethical guidelines for deploying transparent, privacy conscious algorithms in clinical environments. The overall objective is to advance the responsible and verifiable integration of AI systems in medical practice.*

Keywords: *Artificial Intelligence*

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