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The Applications of AI Techniques in Medical Data Processing

Sagar Kalyan Kharade
AISSMS Institute of Information Technology, Pune
sagarkharade554@gmail.com

Abstract: *Medical data processing has become one of the most critical pillars of digital healthcare innovation. The growing volume and complexity of medical information—from imaging and genomic data to patient health records—have driven the need for intelligent systems that can interpret, manage, and analyze this information efficiently. Artificial Intelligence (AI) has emerged as a transformative force in this domain, offering tools and algorithms capable of detecting complex patterns, automating diagnostic processes, and predicting health outcomes. This paper provides a detailed exploration of how AI techniques such as Machine Learning (ML), Deep Learning (DL), and Natural Language Processing (NLP) are revolutionizing medical data processing. It also highlights existing challenges related to data privacy, ethical governance, and interpretability, while discussing solutions like federated learning and explainable AI. The findings suggest that integrating AI with modern healthcare systems leads to enhanced clinical efficiency, improved diagnostic accuracy, and better patient management. The study concludes by emphasizing the importance of human-centered AI systems that complement, rather than replace, medical expertise.*

Keywords: Medical data processing

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