

ARTIFICIAL INTELLIGENCE IN MEDICINE

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Artificial intelligence is rapidly transforming the landscape of modern medicine by enabling more accurate diagnosis, treatment personalization, and streamlined healthcare delivery. According to recent reviews, the integration of AI-driven technologies in medicine is not merely incremental – it represents a paradigm shift. Taking the above-mentioned into account, the paper focuses on the numerous applications of AI technologies in medicine and medical engineering.

One of the primary applications of AI in medicine is diagnostic imaging. Computers help doctors comb through CT and MRI scans for signs of problems like heart disease and cancer, enabling earlier detection of illnesses and potentially more successful interventions. Machine-learning and deep-learning algorithms excel at identifying subtle patterns in large and complex datasets, such as radiographic images or electronic health records, which may elude human clinicians (U.S. Department of Health and Human Services, 2024).

AI systems can analyze genomics, past treatment outcomes, lifestyle factors, and imaging data to suggest individualized therapeutic strategies and predict disease progression. Telemedicine, virtual health assistants, and wearable biosensors –

augmented by AI – also contribute to extending access to care, particularly in remote or resource-constrained settings, thereby addressing equity issues in global health (Fahim et al., 2025).

AlphaFold is an AI-driven system developed by DeepMind to predict protein structures with high accuracy. Its various iterations have been part of the continuous improvement in computational biology. Proteins are essential molecules in living organisms, playing a crucial role in virtually every cellular process. The shape of a protein determines its function, and understanding these shapes is crucial for advancing scientific research in areas like drug discovery, disease diagnosis, and biotechnology (Rehman et al. 2025).

With the growing accumulation of genomic and clinical data, data scientists face both challenges and opportunities when attempting to extract biologically or clinically relevant information from massive genotype and phenotype datasets. In genomics, AI-based technologies and data science techniques have been utilized effectively over the past two decades.

Therefore, the application of artificial intelligence in medicine marked a significant progression in drug discovery. We examine the various stages of the drug discovery process, starting from disease identification and encompassing diagnosis, target identification, screening, and lead discovery. AI's capability to analyze extensive datasets and discern patterns is essential in these stages, enhancing predictions and efficiencies in disease identification, drug discovery, and clinical trial management.

References:

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