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Artificial Intelligence Techniques in Bioinformatics: Unravelling Complex Biological Systems

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Abstract: *This paper reviews the integration of Artificial Intelligence (AI) techniques with bioinformatics, focusing on its applications in absorbing large amounts of biological data and understanding complex biological systems. It covers various AI paradigms, including data mining, machine learning, deep learning, and adaptive algorithms, and their applications in drug discovery, functional genomics, targeted medicine, protein structure prediction, and genomic sequence analysis. The paper emphasizes the role of AI algorithms and biological data in improving knowledge extraction, pattern recognition, and predictive modelling in natural settings. Furthermore, this research evaluates the difficulties and potential applications of AI in bioinformatics, including limitations with data quality, AI model interpretability, integrating multi-omics data, and ethical issues. In summary, this review fabricates the most recent state-of-the-art AI approaches in bioinformatics and offers researchers, practitioners, and stakeholders a road map for utilizing AI developments to effectively decipher biological systems' complexity and produce groundbreaking discoveries and medical applications.*

Keywords: Bioinformatics, Functional Genomics, Multi-omics Data Integration, State-of-the-art

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