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Exploring the Brain's Complexity: Stochastic Models and Artificial Intelligence in Neuroinformatics

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This work emphasizes the transformative potential of leveraging large-scale multimodal data archives in neuroinformatics research, particularly focusing on electrophysiology and neuroimaging datasets. By employing rigorous standardization and harmonization methodologies alongside state-of-the-art AI tools, these archives enable novel scientific discoveries across various brain disorders and diseases. Through detailed exploration of intricate neural networks, with a particular emphasis on conditions such as epilepsy, it is demonstrated how AI-driven approaches facilitate the extraction of nuanced insights from vast, heterogeneous datasets. By systematically integrating advanced mathematical frameworks and AI methodologies, multimodal data archives can be utilized to advance our understanding of brain disorders, offering unprecedented opportunities for groundbreaking discoveries with profound implications for neuroscience research and clinical intervention.

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