

IEEE JOURNAL OF BIOMEDICAL AND HEALTH INFORMATICS

J-BHI Special Issue on “Quantum Computing and AI for Biomedical and Health Informatics in the Generative Era”

In the last few years, quantum computing and quantum AI have become technologies that offer potential new ways of processing and analyzing data in various fields such as biomedical and health informatics. This Special Issue seeks to investigate how these novel technologies, especially generative algorithms, are changing research and practices in biomedical and health informatics. Quantum computing, which has the capacity to perform complex computations that cannot be performed by conventional computers, combined with AI applications that can analyze large complex datasets, is paving the way for potential major advances in this field. This special issue will explore the latest advancements in quantum computing and AI, specifically focusing on generative algorithms in biomedical and health context.

Generative algorithms refer to a set of pioneering machine learning and artificial intelligence techniques. The goal is to produce output that is indistinguishable from the real data in the training set by learning and mimicking the data distribution of that set. In healthcare informatics and biomedical science, generative algorithms can improve diagnostic methods, develop individualized treatments, or generate molecular structures for pharmaceutical discovery, thereby paving the way for predictive analytics and personalized medicine. Due to their ability to generate quality outputs from complex inputs, they have become an integral part of modern AI research and applications. This issue is important as it addresses cutting-edge technologies transforming healthcare research and practice. It's timely due to the rapid advancements in quantum computing and AI, making it crucial to explore their impact and potential. The potential improvement in healthcare brought by the combination of quantum computing, AI and generative algorithms, justify its relevance.

The target audience includes researchers, practitioners, and academics in biomedical and health informatics, quantum computing, and AI. This issue will complement J-BHI by filling a gap in its current coverage, providing a dedicated platform for innovative research at the intersection of these rapidly evolving fields. Also, this issue aligns with the journal's focus on innovative computational approaches in healthcare.

Potential topics include but are not limited to the following:

- Advancements in Generative Algorithms for Quantum Computing in Biomedical Data Analysis.
- Generative Models in Quantum AI for Personalized Medicine.
- Quantum Generative Algorithms for Complex Biological System Modeling.
- Enhancing Drug Discovery through Quantum-Inspired Generative Models.
- Quantum Generative Algorithms for Predictive Health Analytics.
- Generative Approaches in Quantum Machine Learning for Diagnostic Imaging.
- Ethical Implications of Generative Quantum AI in Healthcare.
- Case Studies of Real-World Applications of Generative Algorithms in Quantum AI for Healthcare.
- Foundations and applications of quantum computing in biomedical informatics.
- Developments in Quantum AI for health data analysis.
- Analyzing large health data sets using quantum computing.

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Key Dates

Deadline for Submission: 31 Aug, 2024
First Reviews Due: 05 Oct, 2024
Revised Manuscript Due: 01 Nov, 2024
Final Decision: 01 Dec, 2024