

IEEE JOURNAL OF BIOMEDICAL AND HEALTH INFORMATICS

J-BHI Special Issue on “Current Trends and Future Directions in Biomedical Data Science”

This special issue is dedicated to Professor Panos M. Pardalos on his 70th birthday to celebrate his contributions to this field and provide a platform for researchers to present their latest research findings, ideas, and future directions in biomedical data science.

Data science has rapidly developed over the past decade, with numerous advancements and innovations in machine learning, big data analytics, and artificial intelligence. These developments have significantly impacted various domains, including healthcare systems and biomedical research. Integrating data science techniques into healthcare and biomedical research can revolutionize how we diagnose, treat, and prevent diseases, leading to more personalized and effective treatments. However, biomedical data acquisition, processing, storage, and analysis pose significant challenges. Biomedical data, such as medical images, genomic data, and electronic health records, are often extensive in size and complex in nature, making it challenging to extract meaningful insights.

Furthermore, the increasing volume and variety of biomedical data require advanced techniques and tools for efficient processing and analysis. To address these challenges, researchers and practitioners in biomedical data science are constantly exploring new methods and approaches to analyze and interpret biomedical data. The aim is to develop innovative solutions that can improve disease diagnosis, treatment, and prevention accuracy and efficiency.

The topics of the special issue include, but are not limited to, the following expected applications:

- **Explainable AI (XAI):** In healthcare, it is critical to have interpretable AI models that provide explanations for their predictions. XAI is particularly important for gaining the trust of healthcare professionals and ensuring patient safety.
- **Multi-Omics Integration:** Integrating data from various omics fields, such as genomics, proteomics, and metabolomics, provides a comprehensive view of biological systems. Biomedical data scientists are developing methods to combine and analyze these diverse datasets for a more holistic understanding of health and disease.
- **Microscopic and Biomedical Imaging:** The application of data science techniques to image analysis, segmentation, registration, and fusion in microscopy and biomedical imaging.
- **Next-Generation Sequencing:** Using data science techniques to process and analyze genomic data from next-generation sequencing technologies.
- **Artificial Intelligence for Biomedical Data:** The application of artificial intelligence techniques, including machine learning and deep learning, to analyze and interpret biomedical data.
- **Biomedical Big Data Analytics:** The development of advanced analytics techniques and tools to process and analyze large-scale biomedical data.
- **Optimization and Operation Research for Biomedical Data:** Developing optimization models and algorithms to improve healthcare operations and decision-making processes.
- **Deep Learning for Biomedical Data:** Applying deep learning techniques to biomedical data, including medical imaging and genomic data.
- Additionally, we encourage submissions of surveys and future-oriented papers in biomedical data science.

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Key Dates

Deadline for Submission: 17 Jun 2024
First Reviews Due: 25 Jul 2024
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