

Title of the thematic issue: Explainable Deep Learning based Bioengineering, Bioimaging and Bioinformatics (XDL-BIO3)**Guest Editor: Dr. Kelvin K.L. Wong****Scope of the Thematic Issue:**

Bioengineering, Bioimaging, and Bioinformatics are three interrelated fields in the life sciences that use interdisciplinary approaches to understand and manipulate biological systems. These triple fields play a critical role in advancing our understanding of biological systems and improving human health. By combining engineering, imaging, and computational approaches, researchers can develop new technologies, visualize biological systems in unprecedented detail, and analyze vast amounts of data to gain insights into biological processes and develop new treatments for diseases. Explainable Deep Learning refers to the development of deep learning models that can provide explanations for their decisions and predictions. In the field of Bioengineering, Bioimaging, and Bioinformatics, explainable deep learning has become an important research area due to the need to interpret and understand the results obtained from complex biological systems. In Bioengineering, deep learning models can be used to analyze and model biological systems, such as protein interactions, gene expression, and cellular behavior. These models can provide insight into the underlying mechanisms of these systems, which can then be used to develop new therapies or treatments. In Bioimaging, deep learning models can be used to analyze and interpret images of biological samples, such as cells or tissues. These models can identify features in the images that are associated with disease, and can be used to develop diagnostic tools or to guide treatment decisions. In Bioinformatics, deep learning models can be used to analyze large datasets of biological data, such as genomic or proteomic data. These models can identify patterns and relationships in the data that are difficult for humans to detect, and can be used to develop new hypotheses or to validate existing ones.

Explainable Deep Learning is essential in Bioengineering, Bioimaging, and Bioinformatics to ensure that researchers are making informed decisions and to build trust in the models and technologies that are developed.

Keywords: Bioengineering, Bioimaging and Bioinformatics, Explainable Deep Learning, Bioimaging and Bioengineering applications, analyzing biological systems, drug discovery and development, analyzing genomic data in Bioinformatics.

Sub-topics:

- Development of Explainable artificial intelligence models for analyzing biological systems
- Interpreting machine learning models for Bioimaging applications
- Explainable Deep Learning for personalized medicine in Bioinformatics
- Integration of multi-modal data in deep learning models for Bioimaging and Bioengineering applications
- Building trust in neuro-learning models for Bioengineering, Bioimaging, and Bioinformatics applications
- Explainable Artificial Intelligence for drug discovery and development
- Development of interpretable deep learning models for analyzing genomic data in Bioinformatics
- Interpretability and fairness in deep learning models for healthcare applications
- Explainable Machine Learning for medical image analysis and diagnosis
- Explainable cybernetical intelligence for real-time decision making in critical care applications.
- Distributed Computing for Big Data in Smart Healthcare using Bio-XAI
- AI-enabled remote Patient Monitoring using Big Data

Schedule:

Thematic issue submission deadline

December 10th, 2023

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