

# COMPUTING AND ARTIFICIAL TECHNIQUES FOR LIFE SCIENCE APPLICATIONS

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## DESCRIPTION

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In recent years, with the rapid growth of data in various life science applications, data-driven computational methods are increasingly needed to quickly and accurately analyze large-scale data. Especially, biological and medical technologies, have been providing us explosive volumes of biological and physiological data, such as medical images, electroencephalography, genomic, and protein sequences. Learning from these data facilitates the understanding of human health and disease. In the past several decades, there has been an explosion in the generation and distribution of biological data, including genomic, transcriptomic, proteomic, and bioimaging data. Analysis of public datasets has shown that the generation of sequence data has outpaced Moore's law. Furthermore, in addition to an increase in the sheer size of the data, there has been significant growth in the various types of biological data. Aside from the generation of short sequence reads, there are now long reads, ultralong reads, amplified sequence data, optical mapping data, and mass spectrometry data. The analysis of these datasets—alone or in concert with each other—requires the development of novel combinatorial algorithms, heuristics, machine learning paradigms, and data structures. Also, the growth of data affects the process and accuracy of anatomy, animal biology, bacteriology, biochemistry, cell biology, ecology, evolutionary biology, genetics, molecular biology, plant biology, physiology, and virology applications.

Accordingly, Computation and Machine learning techniques have recently emerged as an “intelligent” method in many life science areas to gain insight from data that has been emphasized in both academia and industry. To expand the scope and ease of the applicability of machine learning, it is highly desirable to make learning algorithms less dependent on handcrafted feature engineering so that novel applications could be constructed faster, and more importantly, to make progress toward artificial intelligence (AI). This special issue aims to target recent computation, machine learning techniques, and some of the state-of-the-art applications in the life science areas such as Bioinformatics, Bioprocess systems, Biomedical systems, Biochemistry, Cell Biology, Ecology and Bioecological system. This Special Issue is devoted to considering original research articles, as well as review articles on computational and intelligent methods in life science and their applications. We require gathering relevant contributions addressed to introduce new techniques for study complex life science systems driven by computational methods. Interdisciplinary applications are particularly welcome. We also encourage authors to contribute their codes and experimental data so they are available to the public, which would make our special issue more infusive and attractive.

**The topics of this special issue include, but are not limited to:**

- ▶ Data mining and knowledge discovery in life science
- ▶ Machine and deep learning approaches for disease, and health data
- ▶ Decision support systems for life science
- ▶ Regression and forecasting for medical and/or biomedical signals
- ▶ Healthcare and wellness information systems
- ▶ Medical signal and image processing and techniques
- ▶ Applications of AI techniques in life science systems
- ▶ Medical data, knowledge bases, and informatics
- ▶ Intelligent computing and platforms in life science
- ▶ Biomedical applications
- ▶ Biomedical text mining
- ▶ Deep learning and methods to explain disease prediction
- ▶ Big data frameworks and architectures for life science
- ▶ Visualization and interactive interfaces related to life science systems
- ▶ Recommending and decision-making models and systems based on AI and data mining technologies
- ▶ Machine learning and deep learning applications for life, disease, cancer, and healthcare
- ▶ Querying and filtering on heterogeneous, multi-source streaming life and health data
- ▶ Internet of things and data management for life science
- ▶ Emerging technologies and applications for life science

## HOW TO SUBMIT

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All submissions to the Special Issue must be made electronically via online submission system Editorial Manager: <https://www.editorialmanager.com/openbiol>

All manuscripts will undergo the standard peer-review process (single blind, at least two independent reviewers). When entering your submission via online submission system please choose the option “**SI on Computing and Artificial Techniques for Life Science Applications**”.

Submission of a manuscript implies that the work described has not been published before and it is not under consideration for publication anywhere else.

The deadline for submissions is **November 20, 2020**, but individual papers will be reviewed and published online on an ongoing basis.

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