

CALL FOR PAPERS

Special Issue of

Computers & Operations Research

Operations Research and Data Mining in Biological Systems

Guest Editors: Enza Messina and Marcello Sanguineti



Scope

In modern biology, the advent of high-throughput technologies, which simultaneously probe thousands of biological entities, has enabled the production of enormous amount of data on organism components and their complex interactions. Analysis of such data requires the development of techniques aimed at extracting hidden information from such huge amount of data. The resulting algorithms should be scalable, robust, and adjustable on line, to exploit new observations as soon as they become available. Developing such algorithms requires novel approaches and can strongly benefit from the combination and constructive interplay of tools from data mining, statistical learning theory, and optimization. Computational sciences and operations research can provide powerful methodologies to elaborate and understand biological data.

The goal of the special issue is two-fold:

- to present powerful optimization methodologies and efficient algorithms to extract information from biological data;
- to stimulate the interest of operations researchers and computational mathematicians in challenging data-intensive problems originating from biology, which make the development of novel methods and algorithms mandatory.

Topics

Papers are solicited from, but not limited to, the following topics:

Management of biological data
acquisition, modelling, integration

Learning methods for biological data:
support vector machines / kernel methods
neural networks
metaheuristics
probabilistic graphical models (Bayesian networks, hidden Markov models)
clustering methods
on-line and reinforcement learning

Optimization issues in biological data:
regularization approaches
inverse problems
optimization of graph models
optimization models for biological systems
metabolic and regulatory networks

Submission Guidelines

The deadline for submission is January 15, 2008. Authors should submit their paper via EES <http://www.ees.elsevier.com/cor> and select “**OR and Data Mining in Biological Systems**” when asked to indicate the “Article Type” in the submission process.

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. Manuscripts will be screened for topical relevance and those that pass the screening process will undergo the standard peer-review process of “Computers & Operations Research”. The major criterion for acceptance is the quality and originality of the contribution. Authors are expected to follow the “Instructions to Authors” of “Computers & Operations Research” (<http://www.elsevier.com/locate/cor>.)

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