

SOFT COMPUTING METHODS FOR CHARACTERIZING DISEASES FROM OMICS DATA

Aim and scope

In modern biomedical research, high-throughput technologies, such as the next generation sequencing, produces huge data sets. High-throughput data are collected in the broad context of genomics, epigenomics, transcriptomics and proteomics. From these data, it is possible to explain the pathogenesis or predict the predisposition and/or the clinical outcome of several human diseases, among which psychiatric, cardiovascular, obesity, aetiology of a number of diseases such as cancer, schizophrenia, and Alzheimer, just to name a few. The identification of new strategies for processing and analyzing such kind of data is becoming more and more necessary since their large amount of data can sometimes represent a real obstacle to effectively identify the most relevant patterns and to build comprehensive models capable of explaining complex biological phenotypes. The aim of the special session is to host original papers and reviews on recent research advances and the state-of-the-art methods in the fields of Soft Computing, Machine Learning and Data Mining methodologies concerning with the processing of omics data in order to shed light about the relationship between genotype and disease-related phenotype.

Topics of interest include, but are not limited to:

- Machine learning
- Sparse Coding
- Data Mining
- Fuzzy and Neuro-Fuzzy Systems
- Probabilistic and statistical modelling
- OMICs in the context of genomics, epigenomics, transcriptomics and proteomics
- Evaluation of protein folding and/or protein-ligand interactions (where ligands are proteins, DNA, RNA and small molecules), also in the context of genetic variation
- Identification of potential gene regulatory elements (i.e., binding of transcription factors, miRNAs, etc.)
- Analysis of common genetic variants (i.e., SNPs, HLA genotypes, microsatellites)
- Analysis of experimental data from next-generation sequencing
- Analysis of gene expression data
- Biomedical applications

Session chairs

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