

CALL FOR PAPERS

CURRENT GENOMICS

Special Issue on Genomic Signal Processing

Guest Editors:

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Techniques developed for signal/image processing are being rapidly adapted in genomic research, where the modeling of transcriptional signaling and related pathways, the inference of model parameters, and the evaluation of the performance and robustness of models play significant roles. In this context, Genomic Signal Processing (GSP) has been defined as the analysis, processing, and use of genomic signals for gaining biological knowledge and the translation of that knowledge into systems-based applications. Since, regulatory decisions in the cell utilize numerous inputs, analytical tools are necessary to model the multivariate influences on decision-making produced by complex genetic networks. Genomic signals must be processed to characterize their regulatory effects and their relationship to changes at both the genotypic and phenotypic levels. GSP integrates the theory and methods of signal processing with the systems approach of genomics, with special emphasis on genomic regulation.

Current Genomics (<http://www.bentham.org/cg/>) publishes in-depth reviews written by leaders in the field covering a wide range of current topics in genomics. For this special issue, we desire high-quality tutorial papers that apply signal processing theory and methods to genomics, in particular, genomic applications based on estimation, classification, clustering, imaging, automatic control, information theory, networks, and computation. Papers must be broad in scope, not restricted to some specialized algorithm. We are especially interested in papers that provide comparative performance analyses. Our ultimate goal is to provide the community with a collection of authoritative, readable papers covering a wide range of topics in genomic signal processing. Strong mathematical content is welcome, but details should be left to an appendix or companion website.

Possible topical areas include, but are not limited to the following:

1. Classification: classifier design, feature selection, and error estimation in genomic applications
2. Clustering: theory, performance, and validation indices
3. Modeling gene regulatory networks
4. Inferring gene regulatory networks from data (and prior knowledge)
5. Simulation or analysis of gene regulatory networks
6. External control of gene regulatory networks
7. Signal processing methods in sequence analysis
8. Microarray image and data analysis
9. Noise models in high-throughput measurement technologies
10. Integration of heterogeneous data and/or biological prior knowledge
11. Genome-wide association studies and data analysis
12. Signal processing for mass spectrometry data analysis
13. Signal Processing for flux balance analysis of metabolic pathways

Schedule. Prospective authors should submit a two-page white paper. Review, revision, and publication will be according to the following schedule:

- White paper due: July 1, 2008
- Invitation notification: August 1, 2008
- Manuscript due: November 1, 2008
- Acceptance notification: January 1, 2009
- Final manuscript due: March 1, 2009
- Publication date: March-April, 2009

Please submit white paper to Edward Dougherty (gsp.special@gmail.com).

More up-to-date information can be found at
<http://groups.google.com/group/gensips/web/current-genomics-special-issue>.