

**Lecture Notes in
Operations Research**

7

Series Editors:
Ding-Zhu Du and Xiang-Sun Zhang

**OPTIMIZATION AND
SYSTEMS BIOLOGY**

The First International Symposium, OSB'07
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Proceedings

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ABOUT OSB 2007

THEME AND SCOPE

The First International Symposium on Optimization and Systems Biology (OSB 2007), organized by Academy of Mathematics and Systems Science within Chinese Academy of Sciences, Shanghai University and The University of Tokyo is held in Beijing, China from August 8 to 10, 2007. The symposium is sponsored by National Natural Science Foundation of China (NSFC).

Systems Biology has become intensive research topics in the recent past decade and attracted much attention of scientists in various areas, such Biology, Mathematics, Physics, and Computer Science. Instead of analyzing individual components or aspects of the organism, systems biology is to study an organism, viewed as a dynamical and interacting network of genes, proteins and biochemical reactions which give rise to life. Many mathematical methods have been adopted in the field. In particular, optimization and statistics play a key role in analyzing and understanding biological mechanisms from system-wide viewpoints. The purpose of OSB 2007 is to provide an international forum for scientists, researchers, educators, and practitioners to exchange ideas and approaches, to present research findings and state-of-the-art solutions in this interdisciplinary field, including optimization methods and their applications on various aspects of Systems Biology.

Theme of the OSB 2007 is interdisciplinary and focuses on computational aspect of Optimization and Computational Systems Biology. We are particularly interested in submissions for the research works motivated by biological problems. Typical, but not exclusive, topics of interest are:

- Optimization Theory & Applications
- Approximation Algorithms
- Combinatorics
- Neural Networks
- Data Mining
- Machine Learning
- High Performance Computing
- Information Theory and Statistical Analysis

- Gene Regulatory Network
- Protein Interaction Network
- Protein Structures and Functions
- Comparative Genomics
- Microbial Community Analysis
- Quantitative Models of Cellular & Multi-Cellular Systems
- Designing and Modeling Synthetic Biological Systems
- Nonlinear Dynamics and Analysis of Biological Systems

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PROCEEDING PAPERS AND CONTRIBUTING AUTHORS

In Proceedings of the First International Symposium on Optimization and Systems Biology (OSB 2007), the papers are indexed by ISTP (Index to Scientific & Technical Proceedings).

Fifty three full papers in this volume cover wide range of optimization and systems biology. Authors of these papers come from Australia, China mainland, France, Hong Kong, Japan, Korea, Thailand, UK, and the United States. Many active researchers in various areas contributed their overview and introduction in their fields besides specific deep research achievements. During the symposium, focusing sessions are organized such as in optimization, systems biology, bioinformatics, feature selection and extraction, networks in cellular systems, dynamic of molecular networks, support vector machine, computational models and algorithms.

OSB 2007 is held in Beijing, the capital of China, a metropolis mingled with tradition and modernity. We hope all the participants will enjoy very much not only the academic exchange, but also the rich cultural heritage of Beijing.

AVAILABILITY

The electronic version of the proceedings can be downloaded from the web sites of ORSC and APORC.

ORSC: <http://www.orsc.org.cn>

APORC: <http://www.aporc.org>