Preface

This Springer volume of *Communications in Computer and Information Science* is dedicated to the 30th EURO mini-conference on Optimization in the Natural Sciences (EmC-ONS 2014), which was held during February 5–9, 2014, in Aveiro, Portugal.

The conference attracted more than 100 registered participants who represented 21 countries from four continents. More than 70 contributed talks were divided into three streams—Optimization and Applications, Dynamical Systems, and Statistics, Bioinformatics, and Health Sciences—and constituted 22 sessions. The participants discussed recent achievements in optimization theory and related areas, exchanged experiences in solving real-world problems, and reported on the latest developments of appropriate models of optimization and their applications in the natural sciences. The 30th EURO mini-conference provided an excellent forum for researchers and practitioners in optimization to promote their recent advances to the wider scientific community and to identify new research challenges in theory, methods, and applications.

The conference topics reflected the huge diversity of different lines of research in optimization and its application in the natural sciences, including:

- Analysis of microarray data or next-generation sequencing
- Applications of modeling and optimization in physics, biology, chemistry, and medicine
- Billiard theory and applications
- Biomedical engineering
- Design optimization
- Data visualization for optimal decisions
- Image processing
- Infinite and semi-infinite optimization with applications
- Inverse problems
- Linear and nonlinear optimization and applications
- Multi-criteria optimization with applications
- Multi-scale optimization with applications
- Optimal control applied to biological models
- Optimal mass transfer
- Optimization in bioinformatics and computational biology
- Shape optimization
- Solution of optimization problems using statistical methods
- Statistics in high-dimensional data
- Statistical methods and visualization
- Statistical and probabilistic modeling
- Wave scattering

Based on a rigorous reviewing process realized by the members of the Program Committee, 13 papers were selected for publication in this volume. The keywords

of the selected papers reflect the diversity of different lines of research in optimization and their applications in the natural sciences covered in this volume: optimal control, data visualization, spatial data analysis, shape optimization, billiards, multi-objective portfolio optimization, Markov chains, warehousing, multi-criteria optimization, simulation of information processing, principal component analysis in clustering, Herglotz's variational problems, multiple-response surface optimization, unreliable queueing systems, inverse problems, optimization of the hyperbolic type systems, suboptimal optimization, geometric optics, random access and others. The articles are grouped into three sections: Optimization and Applications, Dynamical Systems, and Modeling and Statistical Techniques for Data Analysis.

As guest editors, we would like to thank all the authors who contributed to this volume and all the reviewers who accepted the invitation to provide their expertise and give constructive comments. Our special thanks to the computer science editorial team at Springer, in particular to Aliaksandr Birukou, Frank Holzwarth, and Leonie Kunz for the opportunity to organize this volume, their expertise and coordination of the editorial process, and the continuous support and assistance.

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