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# Transactions on Computational Science XX

Special Issue on Voronoi Diagrams  
and Their Applications

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# LNCS Transactions on Computational Science

Computational science, an emerging and increasingly vital field, is now widely recognized as an integral part of scientific and technical investigations, affecting researchers and practitioners in areas ranging from aerospace and automotive research to biochemistry, electronics, geosciences, mathematics, and physics. Computer systems research and the exploitation of applied research naturally complement each other. The increased complexity of many challenges in computational science demands the use of supercomputing, parallel processing, sophisticated algorithms, and advanced system software and architecture. It is therefore invaluable to have input by systems research experts in applied computational science research.

*Transactions on Computational Science* focuses on original high-quality research in the realm of computational science in parallel and distributed environments, also encompassing the underlying theoretical foundations and the applications of large-scale computation. The journal offers practitioners and researchers the opportunity to share computational techniques and solutions in this area, to identify new issues, and to shape future directions for research, and it enables industrial users to apply leading-edge, large-scale, high-performance computational methods.

In addition to addressing various research and application issues, the journal aims to present material that is validated – crucial to the application and advancement of the research conducted in academic and industrial settings. In this spirit, the journal focuses on publications that present results and computational techniques that are verifiable.

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The scope of the journal includes, but is not limited to, the following computational methods and applications:

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- High-Energy Physics
- High-Performance Computing
- Numerical and Scientific Computing
- Parallel and Distributed Computing
- Reconfigurable Hardware
- Scientific Visualization
- Supercomputing
- System-on-Chip Design and Engineering

# Editorial

The Transactions on Computational Science journal is part of the Springer series *Lecture Notes in Computer Science*, and is devoted to the gamut of computational science issues, from theoretical aspects to application-dependent studies and the validation of emerging technologies.

The journal focuses on original high-quality research in the realm of computational science in parallel and distributed environments, encompassing the facilitating theoretical foundations and the applications of large-scale computations and massive data processing. Practitioners and researchers share computational techniques and solutions in the area, identify new issues, and shape future directions for research, as well as enable industrial users to apply the techniques presented.

The current volume is devoted to recent advancements in the area of geometric algorithms, specifically Voronoi Diagrams and their applications. The issue contains ten papers, presented at the International Symposium on Voronoi Diagrams 2012, held in June 2012 at Rutgers University, NJ, USA. These papers provide an in-depth overview of current research on topological data structures and a comprehensive evaluation of their application in cartography, physics, material modeling, chemistry, GIS, motion planning, and computer graphics. The issue also features a position paper by ISVD 2012 Conference Chair Prof. Bahman Kalantari.

We would like to extend our sincere appreciation to Guest Editor Prof. Kalantari, to all of the authors for submitting their papers to this special issue, and the associate editors and referees for their valuable work. We would like to express our gratitude to the LNCS editorial staff of Springer, who supported us at every stage of the project.

It is our hope that the fine collection of papers presented in this special issue will be a valuable resource for Transactions on Computational Science readers and will stimulate further research into the vibrant area of computational science applications.

August 2013

Marina L. Gavrilova  
C.J. Kenneth Tan

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