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Membrane Computing

6th International Workshop, WMC 2005
Vienna, Austria, July 18-21, 2005
Revised Selected and Invited Papers



Springer

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Preface

The present volume is based on papers presented at the 6th Workshop on Membrane Computing, WMC6, which took place in Vienna, Austria, in the period July 18–21, 2005. The first three workshops were organized in Curtea de Argeş, Romania – they took place in August 2000 (with the proceedings published in *Lecture Notes in Computer Science*, volume 2235), in August 2001 (with a selection of papers published as a special issue of *Fundamenta Informaticae*, volume 49, numbers 1–3, 2002), and in August 2002 (with the proceedings published in *Lecture Notes in Computer Science*, volume 2597). The fourth and the fifth workshops were organized in Tarragona, Spain, in July 2003, and in Milan, Italy, in June 2004, with the proceedings published as volumes 2933 and 3365, respectively, of *Lecture Notes in Computer Science*.

The pre-proceedings of WMC6 were published by the Institute for Computer Languages of the Vienna University of Technology, and they were available during the workshop. Conforming with tradition, this workshop, too, was a lively scientific event, with many questions and engaged discussions following presentations of papers.

The current volume is based on a selection of papers from the pre-proceedings. These papers were significantly modified according to the discussions that took place during the workshop, and all the selected papers were additionally refereed. The papers in this volume cover all the main directions of research in membrane computing, ranging from theoretical topics in mathematics and computer science, to application issues, especially in biology. More specifically, these papers present research on topics such as: computational power and complexity classes, new types of P systems, relationships to Petri nets, quantum computing, and brane calculi, determinism vs. nondeterminism, hierarchies, the size of small families, algebraic approaches, and designing polynomial solutions to **NP**-complete problems through the use of membrane systems. Like the previous workshops, the scientific program of WMC6 included invited lectures by leading researchers in membrane computing (all the invited talks are represented in this volume) as well as contributed talks based on refereed papers. Altogether, the volume is a faithful illustration of the current state of research in membrane computing (a comprehensive source of information about this fast emerging area of natural computing is the website <http://psystems.disco.unimib.it>).

The workshop was organized by the Institute for Computer Languages of the Vienna University of Technology, under the auspices of the European Molecular Computing Consortium (EMCC).

The Program Committee consisted of Erzsebeth Csuhaj-Varjú (Budapest, Hungary), Rudolf Freund (Vienna, Austria) – Co-chair, Marian Gheorghe (Sheffield, UK), Hendrik Jan Hoogeboom (Leiden, The Netherlands), Oscar H. Ibarra (Santa Barbara, USA), Natasha Jonoska (Tampa, Florida), Kamala Krithivasan

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The editors are indebted to the participants of WMC6 and in particular to the contributors of this volume. Special thanks go to Springer for the efficient cooperation in the timely production of this volume.

November 2005

Rudolf Freund
Gheorghe Păun
Grzegorz Rozenberg
Arto Salomaa

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