

---

## Preface

These proceedings, published in two separate volumes, contain most of the papers emerged from the Fourth Brainstorming Week on Membrane Computing (BWMC), held in Sevilla, from January 30 to February 3, 2006, in the organization of the Research Group on Natural Computing from the Department of Computer Science and Artificial Intelligence of Sevilla University. The first edition of BWMC was organized at the beginning of February 2003 in Rovira i Virgili University, Tarragona, and the second and the third editions took place in Sevilla at the beginning of February 2004 and February 2005, respectively.

Similarly to the previous editions, the fourth BWMC was conceived as a period of active interaction among the participants, with the emphasis on exchanging ideas and cooperation, hence with only a few (“provocative”) presentations scheduled in the first days of the meeting and with most of the time devoted to the joint work.

As the present volumes show, the efficiency of this type of meetings was again proved to be very high, confirming that the membrane computing is an expanding research area, both with many theoretical issues of current interest and with a growing number of applications, especially in biology and medicine.

The papers included in these volumes, arranged in the alphabetic order of the authors, were collected in the form available at a short time after the brainstorming; several of them are still under elaboration. The idea is that the proceedings are a working instrument, part of the interaction started during the stay of authors in Sevilla, meant to make possible a further interaction, this time having a written support.

A selection of the papers from these volumes will be considered for publication in a special issues of *Theoretical Computer Science* (after the first BWMC, a special issue of *Natural Computing* – volume 2, number 3, 2003, and a special issue of *New Generation Computing* – volume 22, number 4, 2004, were published; papers from the second BWMC have appeared in a special issue of *Journal of Universal Computer Science* – volume 10, number 5, 2004, as well as in a special issue of *Soft Computing* – volume 9, number 5, 2005; a selection of papers written during

the third BWMC have appeared in a special issue of *International Journal of Foundations of Computer Science* – volume 17, number 1, 2006). Other papers elaborated during the fourth BWMC will be submitted to other journals or to suitable conferences. The reader interested in the final version of these papers is advised to check the current bibliography of membrane computing available in the Milano web page <http://psystems.disco.unimib.it>.

The list of participants as well as their email addresses are given below, with the aim of facilitating the further communication and interaction:

1. Alhazov Artion, University of Tarragona, Spain,  
`aartiom@yahoo.com`
2. Balbontín-Noval Delia, University of Sevilla, Spain,  
`delia@us.es`
3. Besozzi Daniela, University of Milano, Italy,  
`besozzi@dico.unimi.it`
4. Bianco Luca, University of Verona, Italy,  
`bianco@sci.univr.it`
5. Busi Nadia, University of Bologna, Italy,  
`busi@cs.unibo.it`
6. Cavaliere Matteo, Microsoft Research–University of Trento, Italy,  
`martew@inwind.it`
7. Cazzaniga Paolo, University of Milano-Bicocca, Italy,  
`cazzaniga@disco.unimib.it`
8. Ceterchi Rodica, University of Bucharest, Romania,  
`rceterchi@gawab.com`
9. Chen Haiming, Institute of Software, Chinese Academy of Sciences, Beijing, China  
`chm@ios.ac.cn`
10. Colomer Cugat M. Angels, University of Lleida, Spain,  
`Colomer@matematica.UdL.es`
11. Cordon Franco Andrés, University of Sevilla, Spain,  
`acordon@us.es`
12. Csuhaj-Varjú Erzsébet, Hungarian Academy of Sciences, Budapest, Hungary,  
`csuhaj@sztaki.hu`
13. Dassow Jürgen, Otto-von-Guericke University, Magdeburg, Germany,  
`dassow@iws.cs.uni-magdeburg.de`
14. Díaz-Pernil Daniel, University of Sevilla, Spain,  
`ddpernil@yahoo.com`
15. Eleftheriakins George, Computer Science Department, City Liberal Studies, Thessaloniki, Greece,  
`eleftheriakis@city.academic.gr`
16. Felloni Sara, University of Milano-Bicocca, Italy,  
`sarafelloni@hotmail.com`
17. Fontana Federico, University of Verona, Italy,  
`fontana@sci.univr.it`

18. Franco Giuditta, University of Verona, Italy,  
`franco@sci.univr.it`
19. Freund Rudolf, Technical University Wien, Austria,  
`rudi@emcc.at`, `rudi@logic.at`
20. Gheorghe Marian, University of Sheffield, United Kingdom,  
`marian@dcs.shef.ac.uk`
21. Graciani Díaz Carmen, University of Sevilla, Spain,  
`cgdiaz@us.es`
22. Gutiérrez-Naranjo Miguel Angel, University of Sevilla, Spain,  
`magutier@us.es`
23. Ionescu Mihai, University of Tarragona, Spain,  
`mihai_caltun@yahoo.com`
24. Ishdorj Tseren-Onolt, University of Sevilla, Spain,  
`tseren@yahoo.com`
25. Leporati Alberto, University of Milano-Bicocca, Italy,  
`leporati@disco.unimib.it`
26. Manca Vincenzo, University of Verona, Italy,  
`vincenzo.manca@univr.it`
27. Muskulus Michael, Leiden University, The Netherlands,  
`muskulus@math.leidenuniv.nl`
28. Nepomuceno-Chamorro Isabel, University of Sevilla, Spain,  
`isabelnepomuc@yahoo.es`
29. Nepomuceno-Chamorro Juan Antonio, University of Sevilla, Spain,  
`janepochamorro@yahoo.es`
30. Nepomuceno-Fernández Angel, University of Sevilla, Spain,  
`nepomuce@us.es`
31. Obtulowicz Adam, Polish Academy of Sciences, Warsaw, Poland,  
`A.Obtulowicz@impan.gov.pl`
32. Păun Gheorghe, Institute of Mathematics of the Romanian Academy, Bucharest,  
Romania, and University of Sevilla, Spain,  
`gpaun@us.es`
33. Pérez-Jiménez Mario de Jesus, University of Sevilla, Spain,  
`marper@us.es`
34. Pescini Dario, University of Milano-Bicocca, Italy,  
`pescini@disco.unimib.it`
35. Riscos-Núñez Agustín, University of Sevilla, Spain,  
`ariscosn@us.es`
36. Rogozhin Yurii, Institute of Mathematics and Computer Science, Chisinau,  
Moldova,  
`rogozhin@math.md`
37. Romero-Campero Francisco José, University of Sevilla, Spain,  
`fran@us.es`
38. Romero Jiménez Alvaro, University of Sevilla, Spain,  
`Alvaro.Romero@cs.us.es`

39. Sburlan Dragoş, Constanţa University, Romania, and University of Sevilla, Spain,  
`dsburlan@univ-ovidius.ro`
40. Sempere Luna José María, Polytechnical University of Valencia, Spain,  
`jsempere@dsic.upv.es`
41. Soler-Toscano Fernando, University of Sevilla, Spain,  
`fsoler@us.es`
42. Vaszil György, Hungarian Academy of Sciences, Budapest, Hungary,  
`vaszil@sztaki.hu`
43. Verlan Sergey, University of Paris 12, Creteil, France,  
`verlan@univ-paris12.fr`
44. Zandron Claudio, University of Milano-Bicocca, Italy,  
`zandron@disco.unimib.it`

As mentioned above, the meeting was organized by the Research Group on Natural Computing from Sevilla University (<http://www.gcn.us.es>)– and all the members of this group were enthusiastically involved in this (not always easy) work. The meeting was supported from various sources: (i) Proyecto de Investigación TIN2005–09345–C04–01 de Ministerio de Educación y Ciencia of Spain, (ii) Grupo de Investigación en Computación Natural (PAI TIC 193) de Junta de Andalucía, (iii) III Plan Propio de la Universidad de Sevilla, as well as by the Department of Computer Science and Artificial Intelligence from Sevilla University.

Gheorghe Păun  
Mario de Jesús Pérez-Jiménez  
(Sevilla, May 10, 2006)