

## Parallel Problem Solving from Nature - PPSN VII

7th International Conference, Granada, Spain, September 7-11, 2002, Proceedings

Bearbeitet von  
Juan J Merelo, Panagiotis Adamidis, Hans-Georg Beyer

1. Auflage 2002. Taschenbuch. xxii, 954 S. Paperback  
ISBN 978 3 540 44139 7  
Format (B x L): 15,5 x 23,5 cm  
Gewicht: 1442 g

Weitere Fachgebiete > EDV, Informatik > Hardwaretechnische Grundlagen >  
Supercomputer, Quantencomputer, DNA-Computing

Zu Inhaltsverzeichnis

schnell und portofrei erhältlich bei

The logo for beck-shop.de features the text "beck-shop.de" in a bold, red, sans-serif font. Above the "i" in "shop" are three red dots of increasing size. Below the main text, the words "DIE FACHBUCHHANDLUNG" are written in a smaller, red, all-caps, sans-serif font.

**beck-shop.de**  
DIE FACHBUCHHANDLUNG

Die Online-Fachbuchhandlung [beck-shop.de](http://beck-shop.de) ist spezialisiert auf Fachbücher, insbesondere Recht, Steuern und Wirtschaft. Im Sortiment finden Sie alle Medien (Bücher, Zeitschriften, CDs, eBooks, etc.) aller Verlage. Ergänzt wird das Programm durch Services wie Neuerscheinungsdienst oder Zusammenstellungen von Büchern zu Sonderpreisen. Der Shop führt mehr als 8 Millionen Produkte.

# Preface

We are proud to introduce the proceedings of the Seventh *International Conference on Parallel Problem Solving from Nature*, *PPSN VII*, held in Granada, Spain, on 7–11 September 2002. PPSN VII was organized back-to-back with the Foundations of Genetic Algorithms (FOGA) conference, which took place in Torremolinos, Malaga, Spain, in the preceding week.

The PPSN series of conferences started in Dortmund, Germany [1]. From that pioneering meeting, the event has been held biennially, in Brussels, Belgium [2], Jerusalem, Israel [3], Berlin, Germany [4], Amsterdam, The Netherlands [5], and Paris, France [6]. During the Paris conference, several bids to host PPSN 2002 were put forward; it was decided that the conference would be held in Granada with Juan J. Merelo Guervós as General Chairman.

The scientific content of the PPSN conference focuses on problem-solving paradigms gleaned from natural models, with an obvious emphasis on those that display an innate parallelism, such as evolutionary algorithms and ant-colony optimization algorithms. The majority of the papers, however, concentrate on evolutionary and hybrid algorithms, as is shown in the contents of this book and its predecessors. This edition of the conference proceedings has a large section on applications, be they to classical problems or to real-world engineering problems, which shows how bioinspired algorithms are extending their use in the realms of business and enterprise.

In total, this volume contains 90 papers, which were selected from the 181 papers submitted to the conference organizers. This means that slightly fewer than half the papers were accepted for inclusion in the conference proceedings, which, at the same time, means that some papers of good quality could not be selected for publication. Each paper was reviewed by at least three persons, and, in some cases, up to five reviews were necessary to reach a decision. Most papers had four reviews. Thus, we are very grateful to the volunteer reviewers who offered their scientific expertise and time in order to come up with a decision that was as fair as possible. We want also to thank all authors of submitted papers for their participation.

The submission procedure was developed and maintained by Pedro Castillo Valdivieso and Juan J. Merelo Guervós, inspired by the one developed by them for the previous PPSN conferences. The submission, reviewing and Chairperson's information systems were written in Perl and used a PostgreSQL relational database system as the back-end. The submission process was mostly smooth, and the system could take the heaviest loads without a glitch. All in all, the system dealt with around 50 000 requests, with several requests per minute at the moments of heaviest load.

Paper assignment was made using a combined greedy/evolutionary algorithm that took into account keyword matches among reviewers and papers. The assignment could be considered successful, since few reviewers declined to review

their assigned papers because of a lack of relevant expertise; at the same time, the average confidence in decisions was  $1.7 \pm 0.7$  (that is, between “Somewhat High” and “Very High”, but closer to the former).

As usual, PPSN VII was a poster-only conference; that is, all papers were presented as posters to facilitate personal discussion and the exchange of ideas between the presenter and the audience. Although this might imply a smaller audience than in the case of an oral presentation, the presenter of a paper has a better chance of getting in touch with the people most interested in her/his topic. Consequently, posters are not “second-class” papers, as they are usually considered in some other conferences – they are just the means of presenting. The 90 papers presented in the conference were grouped into five sessions of about 18 papers each. To simplify the orientation within a poster session and to allow the audience to get a global overview of all sessions, each poster session was introduced by a person belonging to the organizing committee who gave a brief overview of all papers presented within a session.

Only the three invited speakers presented a one-hour oral presentation of their research results, geared towards providing inspiration to the conference attendees. Alexander Nareyek (CMU), Roderic Guigó (IMIM, Barcelona, Spain), and William Hart (Sandia Labs, NM, USA), gave keynote speeches on topics that impinge on natural computation: the human genome project, applications of artificial intelligence to computer games, and the relationship between the fields of evolutionary computation and optimization.

Before the technical sessions began on September 9th, two one-day events took place. Five workshops were organized at the Palacio de Congresos on Sept. 7th, and eleven tutorials took place in the same place the next day. We would like to thank the corresponding chairs, David W. Corne (University of Reading, UK) and Marc Schoenauer (INRIA, France).

Finally, we would like to thank the Departamento de Arquitectura y Tecnología de Computadores of the University of Granada, and the regional and national governments who provided monetary support to the conference. Julio Ortega took the job of filling all forms, and submitting and following-up on them, and we are deeply indebted for this. EvoNet, the network of excellence in evolutionary computation sponsored by the European Union, provided support in the form of travel grants for five students.

Pedro Castillo took the tedious job of helping to maintain the website. The other members of the GeNeura team (Maribel García, José Carpio, Víctor Rivas, Javi García, Brad Dolin, Linda Testa, Gustavo Romero, Jaime Anguiano, Louis Foucart) also had to put up with some tasks related to the fact that their boss was busy at something else (although that very fact, of course, also relieved them of some burden). The other members of the Departamento de Arquitectura y Tecnología de Computadores and the Departamento de Ciencias de Computación e Inteligencia Artificial also provided invaluable support. We are also very grateful to the users of the submission system who were able to spot bugs and communicate them to us in good time.

We expect that these proceedings will help to take the natural computation field a bit further, to make it more aware of the problems out there, and, finally, to make it conscious of its existence as a whole field, not as a fractured set of fieldlets.

Granada, June 2002

Juan Julián Merelo Guervós  
Panagiotis Adamidis  
Hans-Georg Beyer  
José Luis Fernández Villacañas  
Hans-Paul Schwefel

## References

1. Hans-Paul Schwefel, Reinhart Männer, editors. *Proc. 1st Conf. on Parallel Problem Solving from Nature*, Vol. 496 of *Lecture Notes in Computer Science*, Dortmund, Germany, October 1–3, 1991, Springer-Verlag.
2. Reinhart Männer, Bernhard Manderick, editors. *Proc. 2nd Conf. on Parallel Problem Solving from Nature, Brussels, Belgium*, September 28–30, 1992, Elsevier.
3. Reinhart Männer, Yuval Davidor, Hans-Paul Schwefel, editors. *Proc. 3rd Conf. on Parallel Problem Solving from Nature, PPSN III*, Vol. 866 of *Lecture Notes in Computer Science*, Springer-Verlag, 1994.
4. Hans-Michael Voigt, Werner Ebeling, Ingo Rechenberg, Hans-Paul Schwefel, editors. *Proc. 4th Conf. on Parallel Problem Solving from Nature*, Vol. 1141 of *Lecture Notes in Computer Science*, Dortmund, Germany, September 1996, Springer-Verlag.
5. Thomas Back, Agoston E. Eiben, Marc Schoenauer, editors. *Proc. 5th Conf. on Parallel Problem Solving from Nature*, Vol. 1498 of *Lecture Notes in Computer Science*, Dortmund, Germany, September 1998, Springer-Verlag.
6. Marc Schoenauer, Kalyanmoy Deb, Günter Rudolph, Xin Yao, Evelyne Lutton, Juan Julián Merelo, Hans-Paul Schwefel, editors. *Parallel Problem Solving from Nature, PPSN VI*, Vol. 1917 of *Lecture Notes in Computer Science*, Springer-Verlag, 2000.

# PPSN VII Conference Committee

## *Conference Chair*

Juan J. Merelo Guervós  
University of Granada, Spain

## *Program Co-Chairs*

Panagiotis Adamidis  
Technological Educational Institute of Thessaloniki, Greece

Hans-Georg Beyer  
University of Dortmund, Germany

and

José Luis Fernández Villacañas  
Universidad Carlos III, Madrid, Spain

## *Electronic Program Chair*

Pedro Castillo  
University of Granada, Spain

## *Proceedings Chair*

Hans-Paul Schwefel  
University of Dortmund, Germany

## *Finance Chair*

Julio Ortega  
University of Granada, Spain

## *Tutorial Chair*

Marc Schoenauer  
INRIA, France

## *Workshop Chair*

David Corne  
University of Reading, UK

# PPSN VII Steering Committee

Kenneth De Jong  
George Mason University, USA

Agoston E. Eiben  
Free University, Amsterdam, The Netherlands

Juan J. Merelo Guervós  
University of Granada, Spain

Marc Schoenauer  
INRIA, France

Hans-Paul Schwefel  
University of Dortmund, Germany

Hans-Michael Voigt  
Gesellschaft zur Förderung angewandter Informatik e.V. (GFaI), Germany

Xin Yao  
University of Birmingham, UK

## PPSN VII Program Committee

Agapie, Alexandru	Floreano, Dario	Kok, Joost
Alander, Jarmo	Fogarty, Terence	Krink, Thiemo
Alba, Enrique	Fogel, Gary	Kushchu, Ibrahim
Altenberg, Lee	Fonlupt, Cyril	Lamont, Gary
Arnold, Dirk	Fonseca, Carlos	Lanzi, Pier Luca
Bäck, Thomas	Freisleben, Bernd	Larrañaga, Pedro
Banzhaf, Wolfgang	Fukuda, Toshio	Lattaud, Claude
Barbosa, Helio	Furuhashi, Takeshi	Leriche, Rodolphe
Ben Hamida, Sana	Gallard, Raul	Leung, Kwon Sak
Berny, Arnaud	Gero, John	Li, Yun
Bersini, Hugues	Ghosh, Ashish	Liardet, Pierre
Bidaud, Philippe	Giannakoglou, Kyriakos	Louchet, Jean
Bonarini, Andrea	Goodman, Erik	Lozano, Manuel
Booker, Lashon B.	Gottlieb, Jens	Luchian, Henri
Braunschweig, Bertrand	Graña, Manuel	Lutton, Evelynne
Bull, Larry	Greenwood, Garry	Marchiori, Elena
Burke, Edmund	Hao, Jin-Kao	Martin, Worthy
Cagnoni, Stefano	Hart, Emma	Merkle, Larry
Cantu-Paz, Erick	Harvey, Inman	Merz, Peter
Coello, Carlos	Hervás, C.	Meyer, Jean-Arcady
Collet, Pierre	Herdy, Michael	Miller, Julian
Cordon, Oscar	Herrera, Francisco	Moraga, Claudio
Cottam, Ron	Hidalgo, Ignacio	Muehlenbein, Heinz
Cotta-Porras, Carlos	Horn, Jeff	Oates, Martin
Darwen, Paul James	Husbands, Phil	O'Reilly, Una May
Dasgupta, Dipankar	Iba, Hitoshi	Oudeyer, Pierre-Yves
Davis, Dave	Isasi, Pedro	Paechter, Ben
Deb, Kalyanmoy	Jansen, Thomas	Paredis, Jan
De Jong, Ken	Juille, Hughes	Parmee, Ian
Delahaye, Daniel	Julstrom, Bryan	Paton, Ray C.
Dorigo, Marco	Kang, Lishan	Pelikan, Martin
Dozier, Gerry	Kazarlis, Spyros	Petridis, Vasilios
Durand, Nicolas	Keane, Andy J.	Petrowski, Alain
Eiben, Gus	Keijzer, Maarten	Poli, Riccardo
Elorza-Tenreiro, Javier	Keller, Robert	Porto, Bill
Fernandez, Francisco	Kennedy, Jim	Raidl, Guenther
Fillipic, Bogdan	Kita, Hajime	Ratle, Alain
Fleming, Peter	Knowles, Joshua	Reeves, Colin

Reynolds, Robert  
Robilliard, Denis  
Rojas, Ignacio  
Rosca, Justinian  
Ross, Peter  
Rowe, Jonathan  
Rowland, Jem  
Roy, Rajkumar  
Rudolph, Guenter  
Ryan, Conor  
Salomon, Ralf  
Sánchez, Luciano  
Sareni, Bruno

Sarma, Jayshree  
Schaffer, David  
Schwefel, Hans-Paul  
Sebag, Michele  
Sen, Sandip  
Sendhoff, Bernhard  
Sinclair, Mark C.  
Sipper, Moshe  
Smith, Alice E.  
Smith, Jim  
Spears, Bill  
Talbi, El Ghazali  
Tateson, Richard

Tettamanzi, Andrea  
Thierens, Dirk  
Tomassini, Marco  
Tsahalís, Demosthenes  
Tuson, Andrew  
Valls-Ferrán, José-M.  
Venturini, Gilles  
Whitley, Darrell  
Wu, Annie  
Zalzala, Ali  
Zitzler, Eckart



# PPSN VII Tutorials

Carlos A. Coello Coello, *CINVESTAV-IPN, Mexico*

**Evolutionary Multiobjective Optimization: Past, Present and Future**

David Wolfe Corne, *University of Reading, UK*

**Natural Computation in Bioinformatics**

Natalio Krasnogor, *University of Reading, UK*

**Memetic Algorithms**

Jose A. Lozano and Pedro Larrañaga, *University of the Basque Country, Spain*

**Optimization by learning and Simulation  
of Probabilistic Graphical Models**

Evelyne Lutton and Jacques Lévy Véhel, *INRIA - Rocquencourt, France*

**Fractals and Evolutionary Algorithms**

Daniel Merkle, *University of Karlsruhe, Germany*

and Martin Middendorf, *Catholic University of Eichstätt-Ingolstadt, Germany*

**Ant Colony Optimization**

Franz Rothlauf, *University of Bayreuth, Germany*

**Representations for Genetic and Evolutionary Algorithms**

Moshe Sipper, *Ben-Gurion University, Israel*

**Go Forth and Replicate**

Wolfgang Stolzmann, *DaimlerChrysler AG, Germany*

and Pier Luca Lanzi, *Politecnico di Milano, Italy*

**An Introduction to Learning Classifier Systems**

Darrell Whitley, *Colorado State University, USA*

**Evaluating Evolutionary Algorithms**

# PPSN VII Workshops

## **International Workshop on Learning Classifier Systems 2002 – IWLCS 2002**

Wolfgang Stolzmann, Pier Luca Lanzi, and Stewart Wilson

## **International Workshop on Memetic Algorithms III – WOMA-III**

Natalio Krasnogor, William Hart, and Jim Smith

## **Multiobjective Problem Solving from Nature II – MPSN-II**

Joshua Knowles

## **Neural and Evolutionary Computation in the Biosciences – ENB**

Gary Fogel and David Corne

## **Real World Applications II – RWOEC**

Rajkumar Roy and Ashutosh Tiwari