

# Advances in Intelligent and Soft Computing

---

70

**Editor-in-Chief: J. Kacprzyk**

# Advances in Intelligent and Soft Computing

## Editor-in-Chief

Prof. Janusz Kacprzyk  
Systems Research Institute  
Polish Academy of Sciences  
ul. Newelska 6  
01-447 Warsaw  
Poland  
E-mail: kacprzyk@ibspan.waw.pl

---

Further volumes of this series can be found on our homepage: [springer.com](http://springer.com)

Vol. 55. Y. Demazeau, J. Pavón,  
J.M. Corchado, J. Bajo (Eds.)

*7th International Conference on Practical  
Applications of Agents and Multi-Agent  
Systems (PAAMS 2009)*, 2009  
ISBN 978-3-642-00486-5

Vol. 56. H. Wang, Y. Shen,  
T. Huang, Z. Zeng (Eds.)

*The Sixth International Symposium on Neural  
Networks (ISNN 2009)*, 2009  
ISBN 978-3-642-01215-0

Vol. 57. M. Kurzynski,  
M. Wozniak (Eds.)

*Computer Recognition Systems 3*, 2009  
ISBN 978-3-540-93904-7

Vol. 58. J. Mehnen, A. Tiwari,  
M. Köppen, A. Saad (Eds.)

*Applications of Soft Computing*, 2009  
ISBN 978-3-540-89618-0

Vol. 59. K.A. Cyran,

S. Kozielski, J.F. Peters,

U. Stańczyk, A. Wakulicz-Deja (Eds.)

*Man-Machine Interactions*, 2009

ISBN 978-3-642-00562-6

Vol. 60. Z.S. Hippe,

J.L. Kulikowski (Eds.)

*Human-Computer Systems Interaction*, 2009  
ISBN 978-3-642-03201-1

Vol. 61. W. Yu, E.N. Sanchez (Eds.)

*Advances in Computational  
Intelligence*, 2009

ISBN 978-3-642-03155-7

Vol. 62. B. Cao,

T.-F. Li, C.-Y. Zhang (Eds.)

*Fuzzy Information and  
Engineering Volume 2*, 2009

ISBN 978-3-642-03663-7

Vol. 63. Á. Herrero, P. Gastaldo,  
R. Zunino, E. Corchado (Eds.)

*Computational Intelligence in Security for  
Information Systems*, 2009  
ISBN 978-3-642-04090-0

Vol. 64. E. Tkacz, A. Kapczynski (Eds.)  
*Internet – Technical Development and  
Applications*, 2009  
ISBN 978-3-642-05018-3

Vol. 65. E. Kącki, M. Rudnicki,  
J. Stempczyńska (Eds.)

*Computers in Medical Activity*, 2009  
ISBN 978-3-642-04461-8

Vol. 66. G.Q. Huang,  
K.L. Mak, P.G. Maropoulos (Eds.)

*Proceedings of the 6th CIRP-Sponsored  
International Conference on Digital  
Enterprise Technology*, 2009  
ISBN 978-3-642-10429-9

Vol. 67. V. Snášel, P.S. Szczepaniak,  
A. Abraham, J. Kacprzyk (Eds.)

*Advances in Intelligent Web Mastering - 2*, 2010  
ISBN 978-3-642-10686-6

Vol. 68. V.-N. Huynh, Y. Nakamori,

J. Lawry, M. Inuiguchi (Eds.)

*Integrated Uncertainty Management and  
Applications*, 2010  
ISBN 978-3-642-11959-0

Vol. 69. XXX

Vol. 70. Y. Demazeau, F. Dignum,

J.M. Corchado, J. Bajo Pérez (Eds.)

*Advances in Practical Applications of Agents  
and Multiagent Systems*, 2010  
ISBN 978-3-642-12383-2

Yves Demazeau, Frank Dignum,  
Juan M. Corchado, Javier Bajo Pérez (Eds.)

---

# Advances in Practical Applications of Agents and Multiagent Systems

8th International Conference on  
Practical Applications of Agents  
and Multiagent Systems (PAAMS 2010)



Springer

## **Editors**

Yves Demazeau  
Laboratoire d'Informatique de Grenoble  
Centre National de la  
Recherche Scientifique,  
Maison Jean Kuntzmann  
110 av. de la Chimie  
F-38041 Grenoble,  
France  
E-mail: Yves.Demazeau@imag.fr

Juan M. Corchado  
Departamento de Informática  
y Automática  
Facultad de Ciencias  
Universidad de Salamanca  
Plaza de la Merced S/N  
37008 Salamanca  
Spain  
E-mail: corchado@usal.es

Frank Dignum  
Department of Information and  
Computing Sciences  
Universiteit Utrecht  
Centrumgebouw Noord, office A117,  
Padualaan 14, De Uitho  
3584CH Utrecht,  
The Netherlands  
E-mail: dignum@cs.uu.nl

Javier Bajo Pérez  
Escuela Universitaria de Informática  
Universidad Pontificia  
de Salamanca,  
Compañía 5,  
37002 Salamanca,  
Spain  
E-mail: jbajope@upsa.es

ISBN 978-3-642-12383-2

e-ISBN 978-3-642-12384-9

DOI 10.1007/978-3-642-12384-9

Advances in Intelligent and Soft Computing

ISSN 1867-5662

Library of Congress Control Number: 2010924117

© 2010 Springer-Verlag Berlin Heidelberg

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilm or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable for prosecution under the German Copyright Law.

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

*Typeset & Cover Design:* Scientific Publishing Services Pvt. Ltd., Chennai, India.

Printed on acid-free paper

5 4 3 2 1 0

springer.com

# Preface

Research on Agents and Multi-Agent Systems has matured during the last decade and many effective applications of this technology are now deployed. The advances in practical applications of Agents and Multi-Agent systems is continuous and it is necessary to provide an international forum to present and discuss the latest scientific developments and their effective applications, to assess the impact of the approach, and to facilitate technology transfer, in this field.

PAAMS, the International Conference on Practical Applications of Agents and Multi-Agent Systems is an international yearly stage to present, to discuss, and to disseminate the latest advances and the most important outcomes related to real-world applications. It provides a unique opportunity to bring multi-disciplinary experts, academics and practitioners together to exchange their experience in the development of Agents and Multi-Agent Systems.

This volume presents the papers that have been accepted for the 2010 edition. These articles capture the most innovative results and this year's advances. Each paper has been reviewed by three different reviewers, from an international committee composed of 82 members from 26 different countries. From the 66 submissions received, 19 were selected for full presentation at the conference, and 14 were accepted as short papers. Moreover, PAAMS'10 incorporated special sessions and workshops to complement the regular program, which included 85 accepted papers.

We would like to thank all the contributing authors, as well as the members of the Program Committee, Auxiliary Reviewers and the Organizing Committee for their hard and highly valuable work. Their work has helped to contribute to the success of the PAAMS 2010 event. Thanks for your help; PAAMS'10 wouldn't exist without your contribution.

Yves Demazeau  
Frank Dignum  
PAAMS 2010 Program Co-chairs

Juan Manuel Corchado  
Javier Bajo Pérez  
PAAMS 2010 Organizing Co-chairs

# **Organization**

## **General Co-chairs**

Yves Demazeau	Centre National de la Recherche Scientifique (France)
Frank Dignum	Utrecht University (The Netherlands)
Juan M. Corchado	University of Salamanca (Spain)
Javier Bajo Pérez	Pontifical University of Salamanca (Spain)

## **Program Committee**

Yves Demazeau (Co-chairman)	Centre National de la Recherche Scientifique (France)
Frank Dignum (Co-chairman)	Utrecht University (The Netherlands)
Francesco Amigoni	Politecnico di Milano (Italy)
Luis Antunes	University of Lisbon (Portugal)
Olivier Boissier	Ecole Nationale Supérieure des Mines de Saint Etienne (France)
Magnus Boman	Royal Institute of Technology (Sweden)
Juan A. Botía	University of Murcia (Spain)
Vicente Botti	Polytechnic University of Valencia (Spain)
Jeffrey Bradshaw	Florida Institute for Human and Machine Cognition (USA)
Bernard Burg	Panasonic Ltd (USA)
Valerie Camps	University Paul Sabatier (France)
Longbing Cao	University of Technology Sydney (Australia)
Pierre Chevallier	University of Brest (France)
Owen Cliffe	University of Bath (United Kingdom)
Juan M. Corchado	University of Salamanca (Spain)
Rafael Corchuelo	University of Sevilla (Spain)

Keith Decker	University of Delaware (USA)
Jurriaan van Diggelen	TNO (The Netherlands)
Virginia Dignum	Utrecht University (The Netherlands)
Alexis Drogoul	IRD (Institut de Recherche pour le Développement) (Vietnam)
Julie Dugdale	University Pierre Mendes France (France)
Edmund Durfee	University of Michigan (USA)
Amal El Fallah	University of Paris 6 (France)
Torsten Eymann	University of Bayreuth (Germany)
Takayuki Ito	MIT (USA)
Klaus Fischer	DFKI (Germany)
Rubén Fuentes	Complutense University of Madrid (Spain)
Francisco Garijo	Telefónica I+D (Spain)
Khaled Ghedira	National School of Computer Sciences (Tunisia)
Sylvain Giroux	Université de Sherbrooke (Canada)
Pierre Glize	University Paul Sabatier (France)
Vladimir Gorodetski	University of Saint Petersburg (Russia)
Dominic Greenwood	Whitestein Technologies (Switzerland)
Kasper Hallenborg	University of Southern Denmark (Denmark)
Koen Hindriks	University of Delft (The Netherlands)
Shinichi Honiden	National Institute of Informatics Tokyo (Japan)
Tom Holvoet	Catholic University of Leuven (Belgium)
Toru Ishida	University of Kyoto (Japan)
Vicente Julián	Polytechnic University of Valencia (Spain)
Achilles Kameas	Delft University of Patras (Greece)
Franziska Kluegl	University of Örebro (Sweden)
Matthias Klusch	DFKI (Germany)
Martin Kollingbaum	University of Aberdeen (United Kingdom)
Jaroslaw Kozlak	University of Science and Technology in Krakow (Poland)
Beatriz López	University of Gerona (Spain)
Adolfo López Paredes	University of Valladolid (Spain)
Zakaria Maamar	Zayed University (United Arab Emirates)
Rene Mandiau	University of Valenciennes (France)
Philippe Mathieu	University of Lille (France)
Eric Matson	Purdue University (USA)
Fabien Michel	University of Reims (France)
José M. Molina	University Carlos III of Madrid (Spain)
Mirko Morandini	University of Trento (Italy)

Bernard Moulin	University Laval (Canada)
Jörg Müller	Clausthal University of Technology (Germany)
Jean-Pierre Muller	CIRAD-TERA-REV-GREEN (France)
James Odell	James Odell Consultancy (USA)
Eugenio Oliveira	University of Porto (Portugal)
Andrea Omicini	University of Bologna (Italy)
Sascha Ossowski	University of Rey Juan Carlos (Spain)
Julian Padget	University of Bath (United Kingdom)
Van Parunak	New Vectors (USA)
Juan Pavón	Universidad Complutense de Madrid (Spain)
Michal Pechoucek	Czech Technical University in Prague (Czech Republic)
Paolo Petta	University of Vienna (Austria)
Jeremy Pitt	Imperial College of London (United Kingdom)
Antonio Rocha Costa	Universidade Católica de Pelotas (Brazil)
Juan A. Rodríguez Aguilar	IIIA-CSIC (Spain)
Fabrice Saffre	British Telecom (United Kingdom)
Jaime Sichman	University of Sao Paulo (Brazil)
Kostas Stathis	Royal Holloway University of London (UK)
John Thangarajah	RMIT (Australia)
Paolo Torroni	University of Bologna (Italy)
Rainer Unland	University of Duisburg (Germany)
Domenico Ursino	University of Reggio Calabria (Italy)
Birna van Riemsdijk	University of Delft (The Netherlands)
Javier Vázquez Salceda	Polytechnic University of Catalogna (Spain)
Jacques Verriet	Embedded Systems Institute (The Netherlands)
Danny Weyns	Catholic University of Leuven (Belgium)
Niek Wijngaards	Thales, D-CIS lab (The Netherlands)
Michael Winikoff	University of Otago (New Zealand)
Franco Zambonelli	University of Modena (Italy)

## Organizing Committee

Juan M. Corchado (Co-chairman)	University of Salamanca (Spain)
Javier Bajo Pérez (Co-chairman)	Pontifical University of Salamanca (Spain)
Juan F. De Paz	University of Salamanca (Spain)
Sara Rodríguez	University of Salamanca (Spain)
Dante I. Tapia	University of Salamanca (Spain)
M. Dolores Muñoz Vicente	University of Salamanca (Spain)

## Auxiliary Reviewers

Maxime Morge	LIFL/SMAC, Université Lille1 (France)
Giovanni Quattrone	University of Reggio Calabria (Italy)
Pasquale De Meo	University of Reggio Calabria ( Italy)
Yasuyuki Tahara	National Institute of Informatics (Japan)
Rubén Ortiz	University Rey Juan Carlos (Spain)
Matteo Vasirani	University Rey Juan Carlos (Spain)
Moser Fagundes	University Rey Juan Carlos (Spain)
Hakan Duman	BT Innovate & Design (United Kingdom)
Aistis Simaitis	University of Leeds (United Kingdom)
Norman Salazar	IIIA-CSIC (Spain)
Jose L. Fernandez-Marquez	IIIA-CSIC (Spain)
Christoph Niemann	University of Bayreuth (Germany)
Stefan Koenig	University of Bayreuth (Germany)
Luis Gustavo Nardin	University of Sao Paulo (Brazil)
Sara Jane Casare	University of Sao Paulo (Brazil)

# Contents

## Keynote

Multiagent Modelling and Simulation as a Means to Wider Industrial Deployment of Agent Based Computing in Air-Traffic Control .....	1
<i>Michal Pěchouček</i>	

## Real-Time and Personalisation

Real Time Learning of Behaviour Features for Personalised Interest Assessment .....	5
<i>Sylvain Lemouzy, Valérie Camps, Pierre Glize</i>	
A GPU-Based Multi-agent System for Real-Time Simulations .....	15
<i>Guillermo Vigueras, Juan M. Orduña, Miguel Lozano</i>	
CLIC: An Agent-Based Interactive and Autonomous Piece of Art .....	25
<i>Laurent Lacomme, Yves Demazeau, Julie Dugdale</i>	
Collaborative Information Extraction for Adaptive Recommendations in a Multiagent Tourism Recommender System .....	35
<i>Víctor Sánchez-Anquix, Sergio Esparcia, Estefanía Argente, Ana García-Fornes, Vicente Julián</i>	
An Architecture for the Design of Context-Aware Conversational Agents .....	41
<i>David Griol, Nayat Sánchez-Pi, Javier Carbó, José M. Molina</i>	

## Modelling and Computation

A Computational Model on Surprise and Its Effects on Agent Behaviour in Simulated Environments .....	47
<i>Robbert-Jan Merk</i>	
Enhanced Deliberation in BDI-Modelled Agents .....	59
<i>Fernando Koch, Frank Dignum</i>	
Cooperative Behaviors Description for Self-* Systems Implementation .....	69
<i>Hiroyuki Nakagawa, Akihiko Ohsuga, Shinichi Honiden</i>	
Collaborative Dialogue Agent for COPD Self-management in AMICA: A First Insight .....	75
<i>Mario Crespo, Daniel Sánchez, Felipe Crespo, Sonia Astorga, Antonio León</i>	

## Methodology and Engineering

Application of Model Driven Techniques for Agent-Based Simulation .....	81
<i>Rubén Fuentes-Fernández, José M. Galán, Samer Hassan, Adolfo López-Paredes, Juan Pavón</i>	
Using ICARO-T Framework for Reactive Agent-Based Mobile Robots .....	91
<i>José Manuel Gascueña, Antonio Fernández-Caballero, Francisco J. Garijo</i>	
REST-A: An Agent Virtual Machine Based on REST Framework .....	103
<i>Abdelkader Gouaich, Michael Bergeret</i>	
Detection of Overworked Agents in INGENIAS .....	113
<i>Celia Gutierrez, Iván García-Magariño</i>	
Mobile Agents in Vehicular Networks: Taking a First Ride .....	119
<i>Oscar Urra, Sergio Ilarri, Thierry Delot, Eduardo Mena</i>	

## CRISIS Management and Robots

A Multi-Agent System Approach for Interactive Table Using RFID .....	125
<i>Yoann Lebrun, Emmanuel Adam, Sébastien Kubicki, René Mandiau</i>	

<b>Forest Fires Prediction by an Organization Based System . . . . .</b>	135
<i>Aitor Mata, Belén Pérez, Juan M. Corchado</i>	
<b>Self-adaptive Coordination for Robot Teams Accomplishing Critical Activities . . . . .</b>	145
<i>Jean-Pierre Georgé, Marie-Pierre Gleizes, Francisco J. Garijo, Victor Noël, Jean-Paul Arcangeli</i>	
<b>A Cooperative Communications Platform for Safety Critical Robotics: An Experimental Evaluation . . . . .</b>	151
<i>Frederico M. Cunha, Rodrigo A.M. Braga, Luis P. Reis</i>	
<b>A Real Time Approach for Task Allocation in a Disaster Scenario . . . . .</b>	157
<i>Silvia A. Suárez B., Christian G. Quintero M., Josep Lluis de la Rosa</i>	

## Development and Evaluation

<b>ASGARD – A Graphical Monitoring Tool for Distributed Agent Infrastructures . . . . .</b>	163
<i>Jakob Tonn, Silvan Kaiser</i>	
<b>Comparing Three Computational Models of Affect . . . . .</b>	175
<i>Tibor Bosse, Jonathan Gratch, Johan F. Hoorn, Matthijs Portier, Ghazanfar F. Siddiqui</i>	
<b>A Generic Architecture for Realistic Simulations of Complex Financial Dynamics . . . . .</b>	185
<i>Philippe Mathieu, Olivier Brandouy</i>	
<b>SinCity 2.0: An Environment for Exploring the Effectiveness of Multi-agent Learning Techniques . . . . .</b>	199
<i>A. Peleteiro-Ramallo, J.C. Burguillo-Rial, P.S. Rodríguez-Hernández, E. Costa-Montenegro</i>	
<b>A Tracing System Architecture for Self-adaptive Multiagent Systems . . . . .</b>	205
<i>Luis Búrdalo, Andrés Terrasa, Vicente Julián, Ana García-Fornes</i>	

## Search and Problem Solving

<b>An UCT Approach for Anytime Agent-Based Planning . . . . .</b>	211
<i>Damien Pellier, Bruno Bouzy, Marc Métivier</i>	

<b>Elitist Ants Applied to the Undirected Rural Postman Problem .....</b>	221
<i>María-Luisa Pérez-Delgado</i>	
<b>Distributed Bayesian Diagnosis for Telecommunication Networks .....</b>	231
<i>Andrés Sedano-Frade, Javier González-Ordás, Pablo Arozarena-Llopis, Sergio García-Gómez, Alvaro Carrera-Barroso</i>	
<b>Solving an Arc-Routing Problem Using Artificial Ants with a Graph Transformation .....</b>	241
<i>María-Luisa Pérez-Delgado</i>	
 <b>Ambient and Green-by Systems</b>	
<b>Using Situation Calculus for Normative Agents in Urban Wastewater Systems .....</b>	247
<i>Juan-Carlos Nieves, Dario Garcia, Montse Aulinas, Ulises Cortés</i>	
<b>Organization Nesting in a Multi-agent Application for Ambient Intelligence.....</b>	259
<i>Matthieu Castebrunet, Olivier Boissier, Sylvain Giroux, Vincent Rialle</i>	
<b>Advantages of MAS for the Resolution of a Power Management Problem in Smart Homes .....</b>	269
<i>Shadi Abras, Sylvie Pesty, Stephane Ploix, Mireille Jacomino</i>	
<b>A4VANET: Context-Aware JADE-LEAP Agents for VANETS .....</b>	279
<i>Mercedes Amor, Inmaculada Ayala, Lidia Fuentes</i>	
<b>Adaptive Multi-agent System for Multi-sensor Maritime Surveillance .....</b>	285
<i>Jean-Pierre Mano, Jean-Pierre Georgé, Marie-Pierre Gleizes</i>	
<b>Author Index .....</b>	291