

Javier Bajo Pérez et al. (Eds.)

Highlights on Practical Applications of Agents and Multi-Agent Systems

10th International Conference
on Practical Applications of Agents
and Multi-Agent Systems

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

Javier Bajo Pérez, Juan M. Corchado Rodríguez,
Emmanuel Adam, Alfonso Ortega, María N. Moreno,
Elena Navarro, Benjamin Hirsch,
Henrique Lopes-Cardoso, Vicente Julián,
Miguel A. Sánchez, and Philippe Mathieu (Eds.)

Highlights on Practical Applications of Agents and Multi-Agent Systems

10th International Conference on Practical
Applications of Agents and Multi-Agent
Systems

Editors

Javier Bajo Pérez
Facultad de Informática
Universidad Pontificia de Salamanca
Salamanca, Spain

Juan M. Corchado Rodríguez
Departamento de Informática y Automática
Facultad de Ciencias
Universidad de Salamanca
Salamanca, Spain

Emmanuel Adam
LAMIH (UMR CNRS 8530)
Universite de Valenciennes, France

Alfonso Ortega
Departamento de Ingeniería Informática
Calle Francisco Tomás y Valiente
Ciudad Universitaria de Cantoblanco
Madrid, Spain

María N. Moreno
Departamento de Informática y Automática
Facultad de Ciencias
Universidad de Salamanca
Salamanca, Spain

Elena Navarro
Departamento de Informática
University of Castilla-La Mancha
Albacete, Spain

Benjamin Hirsch
EBTIC / Khalifa University
Abu Dhabi, United Arab Emirates

Henrique Lopes-Cardoso
Departamento de Engenharia Informática
Faculdade de Engenharia
Universidade do Porto, Porto, Portugal

Vicente Julián
Departamento de Sistemas Informáticos
y Computación
Universidad Politécnica de Valencia
Valencia, Spain

Miguel A. Sánchez
Facultad de Informática
Universidad Pontificia de Salamanca
Salamanca, Spain

Philippe Mathieu
Université des Sciences et Technologies
de Lille, France

ISSN 1867-5662

ISBN 978-3-642-28761-9

DOI 10.1007/978-3-642-28762-6

Springer Heidelberg New York Dordrecht London

Library of Congress Control Number: 2012933089

e-ISSN 1867-5670

e-ISBN 978-3-642-28762-6

© Springer-Verlag Berlin Heidelberg 2012

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, 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.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

PAAMS'12 Special Sessions are a very useful tool in order to complement the regular program with new or emerging topics of particular interest to the participating community. Special Sessions that emphasized on multi-disciplinary and transversal aspects, as well as cutting-edge topics were especially encouraged and welcome.

Research on Agents and Multi-Agent Systems has matured during the last decade and many effective applications of this technology are now deployed. 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, has become a necessity.

PAAMS, the International Conference on Practical Applications of Agents and Multi-Agent Systems is an evolution of the International Workshop on Practical Applications of Agents and Multi-Agent Systems. PAAMS is an international yearly tribune to present, to discuss, and to disseminate the latest developments 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 2012 edition in the special sessions: COREMAS: COoperative and RE-configurable MultiAgent System for Manufacturing, Logistics and Services domains in Industry, AMMR: Adaptive Multimedia and Multilingual Retrieval, BioMAS: 3rd International Special Session on Bio-Inspired and Multi-Agents Systems: Applications to Languages (BioMAS), WebMiRes: Web Mining and Recommender systems, MASSS: Multi-Agent Systems for Safety and Security, AAA: Assessing Agent Applications), TINMAS: Trust, Incentives and Norms in open Multi-Agent Systems, AMAS: Adaptive Multi-Agent Systems, ASM: Agents for smart mobility, ABAM: Agents Behaviours and Artificial Markets.

We would like to thank all the contributing authors, as well as the members of the Program Committees of the Special Sessions and the Organizing Committee for their hard and highly valuable work. Their work has helped to contribute to the success of the PAAMS'12 event. Thanks for your help, PAAMS'12 wouldn't exist without your contribution.

We thank the sponsors (IEEE Systems Man and Cybernetics Society Spain, AEPIA Asociación Española para la Inteligencia Artificial, APPIA Associação Portuguesa Para a Inteligência Artificial, CNRS Centre national de la recherche scientifique), the Local Organization members and the Program Committee members for their hard work, which was essential for the success of PAAMS'12.

Juan M. Corchado Rodríguez
Javier Bajo
PAAMS'12 Organizing Co-chairs

Organization

Special Sessions

COREMAS: COoperative and RE-configurable MultiAgent System for Manufacturing, Logistics and Services domains in Industry.

BioMAS: 3rd International Special Session on Bio-Inspired and Multi-Agents Systems: Applications to Languages.

WebMiRes: Web Mining and Recommender systems.

MASS: Multi-Agent Systems for Safety and Security.

AAA: Assessing Agent Applications.

TINMAS: Trust, Incentives and Norms in open Multi-Agent Systems.

AMAS: Adaptive Multi-Agent Systems.

ASM: Agents for Smart Mobility.

ABAM: Agents Behaviours and Artificial Markets.

Special Session on COoperative and RE-configurable Multi-Agent System for Manufacturing, Logistics and Services Domains in Industry

Emmanuel Adam

University of Valenciennes, France

Paulo Leitao

Polytechnic Institute of Bragança, Portugal

Special Session on 3rd International Special Session on Bio-Inspired and Multi-Agents Systems: Applications to Languages

Gemma Bel-Enguix

Universitat Rovira i Virgili, Spain

M^a Dolores Jiménez López

Universitat Rovira i Virgili, Spain

Alfonso Ortega de la Puente

Universidad Autónoma de Madrid, Spain

Special Session on Web Mining and Recommender Systems

María N. Moreno (Chair)	University of Salamanca, Spain
Valérie Camps (Chair)	University of Toulouse, France
Ana María Almeida	Institute of Engineering of Porto, Portugal
Anne Laurent	University of Montpellier 2, France
Chris Cornelis	Ghent University, Belgium
Constantino Martins	Institute of Engineering of Porto, Portugal
Maguelonne Teisseire	University of Montpellier 2, France
María José del Jesús	University of Jaen, Spain
Marie-Aude Aufaure	Ecole Centrale de Paris, France
Rafael Corchuelo	University of Sevilla, Spain
Vivian López Batista	University of Salamanca, Spain
Joel Pinho Lucas	HP, Brazil
Salima Hassas	University of Lyon, France
Sylvain Giroux	University of Sherbrooke, Canada
Yolanda Blanco	University of Vigo, Spain
Jérôme Picault	Alcatel-Lucent Bell Labs, France

Special Session on Multi-Agent Systems for Safety and Security

Antonio Fernández-Caballero (Chair)	University of Castilla-La Mancha, Spain
Elena María Navarro Martínez (Chair)	University of Castilla-La Mancha, Spain
Ruth Aguilar-Ponce	Universidad Autónoma de San Luis Potosí, Mexico
Javier Albusac	Universidad de Castilla-La Mancha, Spain
Giuliano Armano	University of Cagliari, Italy
Danilo Avola	Sapienza University of Rome, Italy
Federico Castanedo	Universidad de Deusto, Spain
Rita Cucchiara	Università degli Studi di Modena e Reggio Emilia, Italy
Francisco Garijo	Institut de Recherche en Informatique de Toulouse, France
Marie-Pierre Gleizes	Institut de Recherche en Informatique de Toulouse, France
Zahia Guessoum	Laboratoire d'Informatique de Paris 6, France
Alaa Khamis	The German University in Cairo, Egypt
José Manuel Molina	Universidad Carlos III de Madrid, Spain
Takashi Matsuyama	Kyoto University, Japan
Paulo Novais	Universidade do Minho, Portugal
Juan Pavón	Universidad Complutense de Madrid, Spain
Milind Tambe	University of Southern California, USA

Special Session on Assessing Agent Applications

Benjamin Hirsch	EBTIC / Khalifa University, United Arab Emirates
Tina Balke	University of Bayreuth, Germany
Marco Lützenberger	DAI-Labor, Technical University of Berlin, Germany

Special Session on Trust, Incentives and Norms in open Multi-Agent Systems

Ana Paula Rocha (Chair)	University of Porto, Portugal
Henrique Lopes Cardoso (Chair)	University of Porto, Portugal
Olivier Boissier (Chair)	ENSM Saint-Etienne, France
Ramón Hermoso (Chair)	Universidad Rey Juan Carlos, Spain
Daniel Villatoro	IIIA-CSIC, Spain
Eugénio Oliveira	University of Porto, Portugal
Holger Billhardt	Universidad Rey Juan Carlos, Spain
Joana Urbano	University of Porto, Portugal
Jordi Sabater-Mir	IIIA-CSIC, Spain
Laurent Vercoouter	University of Rouen, France
Nicoletta Fornara	University of Lugano, Switzerland
Sascha Ossowski	Universidad Rey Juan Carlos, Spain
Tibor Bosse	Vrije Universiteit Amsterdam, The Netherlands
Virginia Dignum	Delft University of Technology, The Netherlands
Wamberto Vasconcelos	University of Aberdeen, The Netherlands
Yao-Hua Tan	Delft University of Technology, The Netherlands

Special Session on Adaptive Multi-Agent Systems

Vicente Julian	Polytechnic University of Valencia, Spain
Alberto Fernández	University of Rey Juan Carlos, Spain
Juan M. Corchado	University of Salamanca, Spain
Vicente Botti	Polytechnic University of Valencia, Spain
Sascha Ossowski	University of Rey Juan Carlos, Spain
Sara Rodríguez González	University of Salamanca, Spain
Carlos Carrascosa	Polytechnic University of Valencia, Spain
Javier Bajo	Pontifical University of Salamanca, Spain
Martí Navarro	Polytechnic University of Valencia, Spain

Stella Heras	Polytechnic University of Valencia, Spain
Carlos A. Iglesias	Technical University of Madrid, Spain
Holger Billhardt	University King Juan Carlos I, Spain
Javier Palanca	Polytechnic University of Valencia, Spain
Juan Francisco de Paz Santana	University of Salamanca, Spain
Álvaro Herrero	University of Burgos, Spain
Victor Sanchez	Polytechnic University of Valencia, Spain

Special Session on Agents for Smart Mobility

Miguel Angel Sánchez Vidales	Universidad Pontificia de Salamanca, Spain
------------------------------	--

Special Session on Agents Behaviours and Artificial Markets

Philippe Mathieu (Chair)	University Lille, France
Bruno Beaulfis	University of Lille1, France
Olivier Brandouy	University of Paris 1, France
Andrea Consiglio	University of Palermo, Italy
Florian Hauser	University of Innsbruck, Austria
Juan Pavón	University Complutense Madrid, Spain
Marco Raberto	University of Rejkjavik, Iceland
Roger Waldeck	Telecom Bretagne, France
Hector Zenil	University of Sheffield, United Kingdom

Organizing Committee

Juan M. Corchado (Chairman)	University of Salamanca, Spain
Javier Bajo (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
Fernando de la Prieta Pintado	University of Salamanca, Spain
Davinia Carolina Zato Domínguez	University of Salamanca, Spain

Reviewers

Emmanuelle Grislin

Gauthier Picard

Marin Lujak

Pavel Vrba

Carole Bernon

Jose Barata

Andres Garcia

Jean-Paul Jamont

Zahia Guessoum

Valérie Camps

Montserrat Mateos

Encarnación Beato

Roberto Berjón

Contents

COREMAS: COoperative and RE-configurable Multi Agent System for Manufacturing, Logistics and Services Domains in Industry

Multilevel MAS Architecture for Vehicles Knowledge Propagating 1
Emmanuel Adam, René Mandiau, Emmanuelle Grislin

Nervousness in Dynamic Self-organized Holonic Multi-agent Systems . . . 9
José Barbosa, Paulo Leitão, Emmanuel Adam, Damien Trentesaux

A Typology of Multi-agent Reorganisation Approaches 19
Emmanuelle Grislin-Le Strugeon

BioMAS: 3rd International Special Session on Bio-Inspired and Multi-Agents Systems: Applications to Languages (BioMAS)

**Towards a Meta-model for Natural Computers: An Example Using
Metadepth** 29
Marina de la Cruz, Suzan Awinat

Towards the Automatic Programming of NEPs: A First Case Study 37
Emilio del Rosal, Alfonso Ortega, Marina de la Cruz

A Grammar-Based Multi-Agent System for Language Evolution 45
M^a Dolores Jiménez-López

**On the Syntax-Semantics Interface of Argument Marking
Prepositional Phrases** 53
Roussanka Loukanova, M^a Dolores Jiménez-López

**Overview of the Fault and Bad Language Tolerance in Automatic
User-Agent Dialogues** 61
Diana Pérez-Marín

WebMiRes: Web Mining and Recommender systems

Automatic Adaptation and Recommendation of News Reports Using Surface-Based Methods	69
<i>Joel Azzopardi, Christopher Staff</i>	

Through the Data Modelling Process of Turimov, an Ontology-Based Project for Mobile Intelligent Systems	77
<i>Juan García, Francisco J. García-Peñalvo, Roberto Therón</i>	

Intelligent Recovery Architecture for Personalized Educational Content	85
<i>A. Gil, S. Rodríguez, F. De la Prieta, B. Martín, M. Moreno</i>	

Adaptation Model for PCMAT – Mathematics Collaborative Learning Platform	95
<i>Marta Fernandes, Constantino Martins, Luiz Faria, Paulo Couto, Cristiano Valente, Cristina Bastos, Fátima Costa, Eurico Carrapatoso</i>	

MASSS: Multi-Agent Systems for Safety and Security

Distributed Active-Camera Control Architecture Based on Multi-Agent Systems	103
<i>Alvaro Luis Bustamante, José M. Molina, Miguel A. Patricio</i>	

A Meta-model-Based Tool for Developing Monitoring and Activity Interpretation Systems	113
<i>José Carlos Castillo, José Manuel Gascueña, Elena Navarro, Antonio Fernández-Caballero</i>	

Unconditionally Secure Protocols with Genetic Algorithms	121
<i>Ignacio Hernández-Antón, Fernando Soler-Toscano, Hans van Ditmarsch</i>	

Cooperative Sensor and Actor Networks in Distributed Surveillance Context	129
<i>Alaa Khamis</i>	

Organizing Rescue Agents Using Ad-Hoc Networks	139
<i>Toru Takahashi, Yasuhiko Kitamura, Hiroyoshi Miwa</i>	

Computing Real-Time Dynamic Origin/Destination Matrices from Vehicle-to-Infrastructure Messages Using a Multi-Agent System	147
<i>Rafael Tornero, Javier Martínez, Joaquín Castelló</i>	

Modelling Cryptographic Keys in Dynamic Epistemic Logic with DEMO	155
<i>Hans van Ditmarsch, Jan van Eijck, Ignacio Hernández-Antón, Floor Sietsma, Sunil Simon, Fernando Soler-Toscano</i>	

AAA: Assessing Agent Applications

Assessing Multi-agent Simulations – Inspiration through Application	163
<i>Catherine Cleophas</i>	

Mining Application Development for Research	171
<i>Johannes Fährdrich, Sebastian Ahrndt, Sahin Albayrak</i>	

TINMAS: Trust, Incentives and Norms in Open Multi-Agent Systems

Trust and Transitivity: How Trust-Transfer Works	179
<i>Rino Falcone, Cristiano Castelfranchi</i>	

A Reputation Framework Based on Stock Markets for Selecting Accurate Information Sources	189
<i>Ramón Hermoso</i>	

Contextual Norm-Based Plan Evaluation via Answer Set Programming	197
<i>Sofia Panagiotidi, Javier Vázquez-Salceda, Wamberto Vasconcelos</i>	

Trust and Normative Control in Multi-Agent Systems: An Empirical Study	207
<i>Joana Urbano, Henrique Lopes Cardoso, Ana Paula Rocha, Eugénio Oliveira</i>	

AMAS: Adaptive Multi-Agent Systems

Transparent Multi-Robot Communication Exchange for Executing Robot Behaviors	215
<i>Carlos Agüero, Manuela Veloso</i>	

Using Multi-Agent Systems to Facilitate the Acquisition of Workgroup Competencies	223
<i>Diego Blanco, Alberto Fernández-Isabel, Rubén Fuentes-Fernández, María Guijarro</i>	

Adaptive Vehicle Mode Monitoring Using Embedded Devices with Accelerometers	231
<i>Artis Mednis, Georgijs Kanonirs, Leo Selavo</i>	

Using MAS to Detect Retinal Blood Vessels	239
<i>Carla Pereira, Jason Mahdjoub, Zahia Guessoum, Luís Gonçalves, Manuel Ferreira</i>	

Metalearning in ALBidS: A Strategic Bidding System for Electricity Markets	247
<i>Tiago Pinto, Tiago M. Sousa, Zita Vale, Isabel Praça, Hugo Morais</i>	
An Agent-Based Prototype for Enhancing Sustainability Behavior at an Academic Environment	257
<i>N. Sánchez-Marroño, A. Alonso-Betanzos, O. Fontenla-Romero, V. Bolón-Canedo, N.M. Gotts, J.G. Polhill, T. Craig, R. García-Mira</i>	
ASM: Agents for Smart Mobility	
Mobile Virtual Platform to Develop Multiplatform Mobile Applications	265
<i>R. Berjón, M.E. Beato, G. Villarrubia</i>	
Automatic Route Playback for Powered Wheelchairs	273
<i>R. Berjón, M. Mateos, I. Muriel, G. Villarrubia</i>	
Evaluation of Labor Units of Competency: Facilitating Integration of Disabled People	281
<i>Amparo Jiménez, Amparo Casado, Fernando de la Prieta, Sara Rodríguez, Juan F. De Paz, Javier Bajo</i>	
A Study Case for Facilitating Communication Using NFC	289
<i>Montserrat Mateos, Juan A. Fraile, Roberto Berjón, Miguel A. Sánchez, Pablo Serrano</i>	
Enabling Intelligence on a Wireless Sensor Network Platform	299
<i>M.J. O’Grady, P. Angove, W. Magnin, G.M.P. O’Hare, B. O’Flynn, J. Barton, C. O’Mathuna</i>	
Touch Me: A New and Easier Way for Accessibility Using Smartphones and NFC	307
<i>Miguel A. Sánchez, Montserrat Mateos, Juan A. Fraile, David Pizarro</i>	
ABAM: Agents Behaviours and Artificial Markets	
Earn More, Stay Legal: Novel Multi-agent Support for Islamic Banking	315
<i>Amer Alzaidi, Dimitar Kazakov</i>	
Optimal Portfolio Diversification? A Multi-agent Ecological Competition Analysis	323
<i>Olivier Brandouy, Philippe Mathieu, Iryna Veryzhenko</i>	
Modeling Firms Financial Behavior in an Evolving Economy by Using Artificial Intelligence	333
<i>Gianfranco Giulioni, Edgardo Bucciarelli, Marcello Silvestri</i>	