

Lecture Notes in Artificial Intelligence 7598

Subseries of Lecture Notes in Computer Science

LNAI Series Editors

Randy Goebel

University of Alberta, Edmonton, Canada

Yuzuru Tanaka

Hokkaido University, Sapporo, Japan

Wolfgang Wahlster

DFKI and Saarland University, Saarbrücken, Germany

LNAI Founding Series Editor

Joerg Siekmann

DFKI and Saarland University, Saarbrücken, Germany

Ingo J. Timm Christian Guttman (Eds.)

Multiagent System Technologies

10th German Conference, MATES 2012
Trier, Germany, October 10-12, 2012
Proceedings



Springer

Series Editors

Randy Goebel, University of Alberta, Edmonton, Canada
Jörg Siekmann, University of Saarland, Saarbrücken, Germany
Wolfgang Wahlster, DFKI and University of Saarland, Saarbrücken, Germany

Volume Editors

Ingo J. Timm
University of Trier
Department of Business Information Systems I
Universitätsring 15
54286, Trier
E-mail: itimm@uni-trier.de

Christian Guttman
IBM R&D Laboratories
Level 5, 204 Lygon Street
Carlton, VIC 3051, Australia
and Etisalat British Telecom Innovation Centre (EBTIC)
Khalifa University, Abu Dhabi, United Arab Emirates
and School of Primary Health Care, Monash University
Melbourne, Australia
E-mail: christian.guttman@gmail.com

ISSN 0302-9743
ISBN 978-3-642-33689-8
DOI 10.1007/978-3-642-33690-4
Springer Heidelberg Dordrecht London New York

e-ISSN 1611-3349
e-ISBN 978-3-642-33690-4

Library of Congress Control Number: 2012947928

CR Subject Classification (1998): I.2.11, I.2.8, K.4.4, H.3.4, H.4.1, I.6.5, I.6.8, I.2.3-4

LNCS Sublibrary: SL 7 – Artificial Intelligence

© Springer-Verlag Berlin Heidelberg 2012

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, re-use of illustrations, recitation, broadcasting, reproduction on microfilms 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 to 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.

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

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

Preface

This volume contains the papers accepted for presentation at MATES 2012, the 10th German Conference on Multiagent System Technologies, held on October 10–12, 2012 in Trier, Germany. Over the past decade, the MATES conference series has established itself as a growing and important forum for researchers, users (members of business and industry), and developers of intelligent agents and multi-agent systems, in Germany and beyond. Current challenges in society require intelligent technologies like agents and multi-agent systems to enable companies and organizations to be more resilient, inter-connected, and collaborative. Hence, the conference investigates technologies for truly open distributed systems covering a wide spectrum of approaches from self-organization and autonomous systems to agreement computing.

This year's MATES conference celebrates two anniversaries: the 10th anniversary of MATES and the 20th anniversary of the German special interest group on Distributed Artificial Intelligence. MATES 2012 was organized by the German special interest group on Distributed Artificial Intelligence (Gesellschaft für Informatik e.V. Fachgruppe Verteilte Künstliche Intelligenz) together with the steering committee of MATES to promote theory and application of agents and multi-agent systems.

MATES 2012 received 39 submissions. Each submission was reviewed by at least three program committee members, who provided reviews to the authors and recommendations to the MATES chairs. Based on these recommendations, MATES decided to accept 7 full papers (18% acceptance rate), and also one invited paper. We also decided to include 6 short papers outlining preliminary work with promising future directions. We were pleased to host two prominent invited speakers in the agent community: Dr. Jeffrey Bradshaw (Florida Institute for Human and Machine Cognition, USA), and Prof. Dr. Stefan Kirn (University of Hohenheim, Germany). Both presented work on the advances of agent system technologies.

We would like to thank the authors and reviewers for their excellent work. Furthermore, we would like to thank Ralf Gerstner as well as the local staff of the University of Trier, including Ralf Schepers, Melanie Müller, Axel Kalenborn, and Tjorben Bogon, for their support in the organization of MATES 2012. As chairs of MATES 2011, Franziska Klügl and Sascha Ossowski provided support in starting up the MATES 2012 conference – thank you. The reviewing process and proceedings were organized using EasyChair. We are also grateful to the IBM R&D lab, Melbourne, Australia for their support of MATES 2012.

July 2012

Ingo J. Timm
Christian Guttman

Conference Officials of MATES 2012

Conference Chairs

Christian Guttman	IBM R&D Laboratories, Australia, EBTIC – Etisalat British Telecom Innovation Centre / Khalifa University, United Arab Emirates and Monash University, Australia
Ingo J. Timm	University of Trier, Germany

Doctoral Consortium Chair

René Schumann	University of Applied Sciences Western Switzerland, Sierre, Switzerland
---------------	--

Steering Committee of the MATES Conference Series

Matthias Klusch	DFKI, Germany
Winfried Lamersdorf	University of Hamburg, Germany
Jörg P. Müller	Technische Universität Clausthal, Germany
Paolo Petta	University of Vienna, Austria
Rainer Unland	University of Duisburg-Essen, Germany

Organization

Program Committee

Klaus-Dieter Althoff	German Research Center for Artificial Intelligence (DFKI) / University of Hildesheim, Germany
Bernhard Bauer	University of Augsburg, Germany
Holger Billhardt	Universidad Rey Juan Carlos, Spain
Vicent Botti	Universitat Politècnica de València, Spain
Jeffrey Bradshaw	Florida Institute for Human and Machine Cognition, USA
Lars Braubach	University of Hamburg, Germany
Joerg Denzinger	University of Calgary, Canada
Juergen Dix	Clausthal University of Technology, Germany
Torsten Eymann	University of Bayreuth, Germany
Maria Ganzha	University of Gdańsk, Poland
Christian Guttman	IBM R&D labs, Australia and Etisalat British Telecom Innovation Centre (EBTIC) / Khalifa University, United Arab Emirates and Monash University, Australia
Koen Hindriks	Delft University of Technology, The Netherlands
Benjamin Hirsch	Etisalat British Telecom Innovation Centre (EBTIC) / Khalifa University, United Arab Emirates
Tom Holvoet	Catholic University of Leuven, Belgium
Michael Huhns	University of South Carolina, USA
Samin Karim	Melbourne University, Australia
Stefan Kirn	University of Hohenheim, Germany
Franziska Klügl	Örebro University, Sweden
Matthias Klusch	German Research Center for Artificial Intelligence (DFKI), Germany
Daniel Kudenko	University of York, UK
Stefano Lodi	University of Bologna, Italy
Marco Luetzenberger	Technical University of Berlin, Germany
Beatriz López	University of Girona, Spain
Daniel Moldt	University of Hamburg, Germany
Joerg Mueller	Clausthal University of Technology, Germany
Eugénio Oliveira	University of Porto, Portugal
Andrea Omicini	Università di Bologna, Italy

Sascha Ossowski	University Rey Juan Carlos, Spain
Julian Padget	University of Bath, UK
Marcin Paprzycki	Polish Academy of Science, Poland
Mathias Petsch	Technical University of Ilmenau, Germany
Paolo Petta	Austrian Research Institute for Artificial Intelligence, Austria
Alexander Pokahr	University of Hamburg, Germany
Marco Schorlemmer	Artificial Intelligence Research Institute, Spain
René Schumann	University of Applied Sciences Western Switzerland, Switzerland
Frank Schweitzer	ETH Zurich, Switzerland
Akash Singh	IBM California, USA
Michael Thielscher	University of New South Wales, Australia
Ingo J. Timm	University of Trier, Germany
Denis Trcek	University of Ljubljana, Slovenia
Rainer Unland	University of Duisburg-Essen, Germany
Gerhard Weiss	University of Maastricht, The Netherlands
Cees Witteveen	Delft University of Technology, The Netherlands

Additional Reviewers

Ahrndt, Sebastian	Rocha, Ana
Bogon, Tjorben	Schüle, Michael
Bulling, Nils	Tanase, Dorian
Hermoso, Ramon	Ter Mors, Adriaan
Kaisers, Michael	van Lon, Rinde
Karänke, Paul	Zanetti, Marcelo
Koster, Andrew	Zhang, Dongmo
Patzlaff, Marcel	Zhao, Dengji

Table of Contents

Invited Talk: Human-Agent Teamwork in Cyber Defense	1
<i>Jeffrey M. Bradshaw</i>	
Invited Talk: 25 Years of Distributed AI in Germany: From the Very Beginnings to Multiagent Applications in Industry in Germany Today	3
<i>Stefan Kirn</i>	
Exploiting Dynamic Weaving for Self-managed Agents in the IoT	5
<i>Inmaculada Ayala, Mercedes Amor Pinilla, and Lidia Fuentes</i>	
Distributed Learning of Best Response Behaviors in Concurrent Iterated Many-Object Negotiations	15
<i>Jan Ole Berndt and Otthein Herzog</i>	
Gaining a Better Quality Depending on More Exploration in PSO	30
<i>Tjorben Bogon, Meike Endres, and Ingo J. Timm</i>	
Evolutionary Dynamics of Ant Colony Optimization	40
<i>Haitham Bou Ammar, Karl Tuyls, and Michael Kaisers</i>	
Human-Agent Teamwork in Cyber Operations: Supporting Co-evolution of Tasks and Artifacts with Luna	53
<i>Larry Bunch, Jeffrey M. Bradshaw, Marco Carvalho, Tom Eskridge, Paul J. Feltoovich, James Lott, and Andrzej Uszok</i>	
A Novel Strategy for Efficient Negotiation in Complex Environments . . .	68
<i>Siqi Chen and Gerhard Weiss</i>	
Selfish Road Users – Case Studies on Rule Breaking Agents for Traffic Simulation	83
<i>Jörg Dallmeyer, Andreas D. Lattner, and Ingo J. Timm</i>	
Modelling Emotional Trajectories of Individuals in an Online Chat	96
<i>Maros Galik and Stefan Rank</i>	
Using Time as a Strategic Element in Continuous Double Auctions	106
<i>Marcel Neumann, Karl Tuyls, and Michael Kaisers</i>	
Goal Delegation without Goals: BDI Agents in Harmony with OCMAS Principles	116
<i>Alexander Pokahr and Lars Braubach</i>	

A Multi-robot Coverage Approach Based on Stigmergic
Communication 126
Bijan Ranjbar-Sahraei, Gerhard Weiss, and Ali Nakisaei

Multi-Agent Systems Applied to the Field of Ornamental Plants 139
*Francisco Javier Rodríguez-Martínez, Tito Valencia-Requejo, and
Lorena Otero-Cerdeira*

An Argumentation-Based Approach to Cooperative Multi-source
Epistemic Conflict Resolution 154
*Mohammad Taghi Saffar, Fattaneh Taghiyareh, Sajjad Salehi, and
Kambiz Badie*

The Importance of Being Accurate in Agent-Based Models –
An Illustration with Agent Aging 165
Julia Schindler

Author Index 179