Preface

Agents are software processes that perceive and act in an environment, processing their perceptions to make intelligent decisions about actions to achieve their goals. Multi-agent systems have multiple agents that work in the same environment to achieve either joint or conflicting goals. Agent computing and technology is an exciting, emerging paradigm expected to play a key role in many society-changing practices from disaster response to manufacturing to agriculture. Agent and multi-agent researchers are focused on building working systems that bring together a broad range of technical areas from market theory to software engineering to user interfaces. Agent systems are expected to operate in real-world environments, with all the challenges complex environments present.

After 11 successful PRIMA workshops/conferences (Pacific-Rim International Conference/Workshop on Multi-Agents), PRIMA became a new conference titled “International Conference on Principles of Practice in Multi-Agent Systems” in 2009. With over 100 submissions, an acceptance rate for full papers of 25% and 50% for posters, a demonstration session, an industry track, a RoboCup competition and workshops and tutorials, PRIMA has become an important venue for multi-agent research. Papers submitted are from all parts of the world, though with a higher representation of Pacific Rim countries than other major multi-agent research forums. This volume presents 34 high-quality and exciting technical papers on multimedia research and an additional 18 poster papers that give brief views on exciting research.

In 2009, the specific theme of the conference was on practical systems. Multi-agent systems show great promise for changing and improving the way complex goals are achieved in the real world, but despite many years of research this promise remains largely unrealized. By focusing this conference on practical aspects of multi-agent systems, we hope to encourage work that allows the promise to be realized. Papers on topics such as participatory simulation, practical auctions, ontology building and framework evaluation move us towards this goal.

To improve the focus on practical systems, PRIMA 2009 included two special tracks that encouraged particularly practical papers. The industrial track encouraged descriptions of systems that are either being built in industry or for real industrial problems. The multimedia track gave authors an opportunity to present their research in a multimedia format, if they believed this provided a better way of exhibiting the research contribution of their work. The 11 papers from these tracks, in this volume, represent particularly practical and exciting work.

December 2009

Jung-Jin Yang
Makoto Yokoo
Takayuki Ito
Zhi Jin
Paul Scerri
Organization

General Chairs

Jung-Jin Yang Catholic University of Korea, Korea
Makoto Yokoo Kyushu University, Japan

Program Chairs

Takayuki Ito Nagoya Institute of Technology/Massachusetts Institute of Technology, Japan/USA
Zhi Jin Peking University, China
Paul Scerri Carnegie Mellon University, USA

Industry Track Program Chairs

Satoshi Kurihara Osaka University, Japan
Minjie Zhang University of Wollongong, Australia

Publicity Co-chairs

Shigeo Matsubara Kyoto University, Japan
Tony Bastin Roy University of Otago, New Zealand
Savarimuthu

Sponsorship Chairs

Nirmit V Desai IBM, India
Akihiko Ohsuga The University of Electro-Communications, Japan

Tutorial / Interactive Session Chair

Tsunenori Mine Kyushu University, Japan
Buy The Duy Vietnam National University, Vietnam
Workshop Chair

Quan Bai  
CSIRO, Australia

Naoki Fukuta  
Shizuoka University, Japan

Financial Chair

Tokuro Matsuo  
Yamagata University, Japan

Valentin Robu  
Southampton University, UK

Publications Chair

Takahiro Uchiya  
Nagoya Institute of Technology, Japan

Gita Sukthankar  
University of Central Florida, USA

Agent School and Doctoral Mentoring Track and Demonstration Session Chair

Hiromitsu Hattori  
Kyoto University, Japan

Jane Hsu  
National Taiwan University, Taiwan

Local Arrangements Chair

Hirofumi Yamaki  
Nagoya University, Japan

Shohey Kato  
Nagoya Institute of Technology, Japan

Agent Event Chair: (RobuCup)

Itsuki Noda  
AIST, Japan

Xiaoping Chen  
USTC, China

Oliver Obst  
CSIRO, Australia

Advisory Committee Members

Toru Ishida  
Kyoto University, Japan

Hideyuki Nakashima  
Future University of Hakodate, Japan

Chengqi Zhang  
University of Technology, Sydney, Australia

Muninder P. Singh  
North Carolina State University, USA

Alexis Drogoul  
University of Paris 6, France

Von Won Soo  
National Tsing Hua University, Taiwan

R. Sadananda  
University of New South Wales, Australia
Program Committee

Quan Bai  
Ladislau Boloni  
Stephane Bressan  
Brahim Chaib-draa  
Nilanjan Chakraborty  
Shih-Fen Cheng  
Sung-Bae Cho  
Joongmin Choi  
Joaquin Delgado  
J.g Denzinger  
Frank Dignum  
Alexis Drogoul  
Shaheen Fatima  
Satoru Fujita  
Naoki Fukuta  
Aditya Ghose  
Joseph Giampapa  
Robin Glinton  
Guido Governatori  
Hiromitsu Hattori  
Koen Hindriks  
Shanli Hu  
Atsushi Iwasaki  
Kiyoshi Izumi  
Wenpin Jiao  
Catholijn Jonker  
Takahiro Kawamura  
Kee-Eung Kim  
Minkoo Kim  
Yasuhiro Kitamura  
Jean-Luc Koning  
Jaeho Lee  
Ho-fung Leung  
Wei Li  
Alan Liu  
Chao-Lin Liu  
Jyi-shane Liu  
Lin Liu  
Miguel A. Lopez-Carmona  
Graham Low  
Xudong Luo  
Wenji Mao  
Xinjun Mao  
Ivan Marsa-Maestre  
Shigeo Matsumbara  
Chunyan Miao  
Shivashankar Nair  
Jean Oh  
Akihiko Ohsuga  
Mehmet Orgun  
Vineet Padmanabhan  
Praveen Paruchuri  
Valentin Robu  
Antonino Rotolo  
Yuko Sakurai  
Von-Wun Soo  
Leon Stering  
Leon Sterling  
Toshiharu Sugawara  
Xijin Tang  
Takao Terano  
Pradeep Varakantham  
Wayne Wobcke  
Jun Yan  
Minjie Zhang  
Wei Zhang  
Zili Zhang  
Roie Zivan  
Leon van der Torre  
Satoshi Kurihara
Table of Contents

Technical Papers

A Market-Based Multi-Issue Negotiation Model Considering Multiple Preferences in Dynamic E-Marketplaces ............................ 1  
  Fenghui Ren, Minjie Zhang, Chunyan Miao, and Zhiqi Shen

Designing Protocols for Collaborative Translation ......................... 17  
  Daisuke Morita and Toru Ishida

An Affective Agent Playing Tic-Tac-Toe as Part of a Healing Environment ...................................................... 33  
  Matthijs Pontier and Ghazanfar Farooq Siddiqui

A Multi-agent Model for Emotion Contagion Spirals Integrated within a Supporting Ambient Agent Model ................................. 48  
  Tibor Bosse, Rob Duell, Zulfiqar A. Memon, Jan Treur, and C. Natalie van der Wal

Statistical Utterance Selection Using Word Co-occurrence for a Dialogue Agent ................................................................. 68  
  Naoki Isomura, Fujio Toriumi, and Kenichiro Ishii

On the Impact of Witness-Based Collusion in Agent Societies.............. 80  
  Amirali Salehi-Abhari and Tony White

Efficient Methods for Multi-agent Multi-issue Negotiation: Allocating Resources ................................................................. 97  
  Mengxiao Wu, Matthijs de Weerdt, and Han La Poutré

Token Based Resource Sharing in Heterogeneous Multi-agent Teams .... 113  
  Yang Xu and Paul Scerri

Gaia Agents Implementation through Models Transformation .......... 127  
  Nikolaos Spanoudakis and Pavlos Moraitis

ONTOMO: Development of Ontology Building Service: Evaluation of Instance Recommendation Using Proper Noun Extraction ............... 143  
  I. Shin, Takahiro Kawamura, Hiroyuki Nakagawa, Ken Nakayama, Yasuyuki Tahara, and Akihiko Ohsuga

Syncretic Argumentation by Means of Lattice Homomorphism .......... 159  
  Taichi Hasegawa, Safia Abbas, and Hajime Sawamura

Adaptive Adjustment of Starting Price for Agents in Continuous Double Auctions ................................................................. 175  
  Huiye Ma and Harry Timmermans
### Table of Contents

SIM-MADARP: An Agent-Based Tool for Dial-a-Ride Simulation  .............................................. 191  
*Makarena Donoso, Daniel Sandoval, and Claudio Cubillos*

An Empirical Study of Agent Programs: A Dynamic Blocks World  
Case Study in GOAL ........................................................................................................ 200  
*M. Birna van Riemsdijk and Koen V. Hindriks*

A Multiagent Model for Provider-Centered Trust in Composite Web Services  ................................................................. 216  
*Julien Bourdon, Laurent Vercouter, and Toru Ishida*

Memory Complexity of Automated Trust Negotiation Strategies  .................................................. 229  
*Indika H. Katugampala, Hirofumi Yamaki, and Yukiko Yamaguchi*

Layered Distributed Constraint Optimization Problem for Resource Allocation Problem in Distributed Sensor Networks  .......................................................... 245  
*Kazuhiro Ota, Toshihiro Matsui, and Hiroshi Matsuo*

NegoExplorer: A Region-Based Recursive Approach to Bilateral Multi-attribute Negotiation  .............................................. 261  
*Miguel A. López-Carmona, Ivan Marsa-Maestre, Enrique de la Hoz, and Juan R. Velasco*

Applying User Feedback and Query Learning Methods to Multiple Communities  ................................................................. 276  
*Tsunenori Mine and Hirotake Kobayashi*

An Adaptive Human-Aware Software Agent Supporting Attention-Demanding Tasks  .................................................. 292  
*Tibor Bosse, Zulfiqar A. Memon, Jan Treur, and Muhammad Umair*

Designing a Two-Sided Matching Protocol under Asymmetric Information  ................................................................. 308  
*Masanori Hatanaka and Shigeo Matsubara*

Emotion Detection from Body Motion of Human Form Robot Based on Laban Movement Analysis  ................................................................. 322  
*Megumi Masuda, Shohei Kato, and Hidenori Itoh*

HoneySpam 2.0: Profiling Web Spambot Behaviour  ........................................................................ 335  
*Pedram Hayati, Kevin Chai, Vidyasagar Potdar, and Alex Talevski*

### Multimedia Papers

A Modeling Tool for Service-Oriented Open Multiagent Systems  .............................................. 345  
*Emilia Garcia, Estefania Argente, and Adriana Giret*

Analysis, Comparison and Selection of MAS Software Engineering Processes and Tools  ................................................................. 361  
*Emilia Garcia, Adriana Giret, and Vicente Botti*
# Table of Contents

## A Synchronous Model of Mental Rhythm Using Paralanguage for Communication Robots

*Takanori Hayashi, Shohei Kato, and Hidenori Itoh*  
Page 376

## Generating Association-Based Motion through Human-Robot Interaction

*Satona Motomura, Shohei Kato, and Hidenori Itoh*  
Page 389

## SmartContractor: A Distributed Task Assignment System Based on the Simple Contract Net Protocol

*Bipin Khanal, Hideyuki Sugiura, Takayuki Ito, Masashi Iwasaki, Katsuhide Fujita, and Masao Kobayashi*  
Page 403

## Participatory Simulation Environment gumonji/Q: A Network Game Empowered by Agents

*Shohei Yamane, Shoichi Sawada, Hiromitsu Hattori, Marika Odagaki, Kengo Nakajima, and Toru Ishida*  
Page 416

## Industrial Papers

### A Multi-Agent-System Based Approach to Intelligent Process Automation Systems

*Vu Van Tan and Myeong-Jae Yi*  
Page 428

### Non-equity Joints among Small and Medium Enterprises and Innovation Management: An Empirical Analysis Based on Simulation

*Marco Remondino, Marco Pironti, and Roberto Schiesari*  
Page 443

### Wide-Area Traffic Simulation Based on Driving Behavior Model

*Yuu Nakajima, Yoshiyuki Nakai, Hattori Hiromitsu, and Toru Ishida*  
Page 459

### An Agent-Based Framework for Healthcare Support System

*Hideyuki Takahashi, Satoru Izumi, Takuho Suganuma, Tetsuo Kinoshita, and Norio Shiratori*  
Page 471

### Interpolation System of Traffic Condition by Estimation/Learning Agents

*Tetsuo Morita, Junji Yano, and Kouji Kagawa*  
Page 487

## Poster Papers

### A Fuzzy Rule-Based System for Ontology Mapping

*Susel Fernández, Juan R. Velasco, and Miguel A. López-Carmona*  
Page 500

### Where Are All the Agents? On the Gap between Theory and Practice of Agent-Based Referral Networks: An Inter-agent Communication Perspective

*Nicola Dragoni*  
Page 508
SADE: A Development Environment for Adaptive Multi-Agent Systems ........................................................ 516
Menggao Dong, Xinjun Mao, Junwen Yin, Zhiming Chang, and Zhichang Qi

Recursive Adaptation of Step size Parameter for Non-stationary Environments ................................................... 525
Itsuki Noda

Mechanism Design Simulation for Healthcare Reform in China ................................................................. 534
Guanqun Liang, Hirofumi Yamaki, and Huanye Sheng

Case Learning in CBR-Based Agent Systems for Ship Collision Avoidance .............................................................. 542
Yuhong Liu, Chunjing Yang, Yubin Yang, Fuhua Lin, and Xuanmin Du

An Adaptive Agent Model for Emotion Reading by Mirroring Body States and Hebbian Learning .......................... 552
Tibor Bosse, Zulfiqar A. Memon, and Jan Treur

Agent Evacuation Simulation Using a Hybrid Network and Free Space Models .......................................................... 563
Masaru Okaya, Shigeru Yotsukura, Kei Sato, and Tomoichi Takahashi

Designing Agent Behaviour in Agent-Based Simulation through Participatory Method ........................................ 571
Patrick Taillandier and Elodie Buard

Influence of Social Networks on Recovering Large Scale Distributed Systems ............................................................ 579
Wei Ren, Yang Xu, Jinmei Luo, and Liying Guo

Dynamic Evolution of Role Taxonomies through Multidimensional Clustering in Multiagent Organizations ................. 587
Ramón Hermoso, Holger Billhardt, and Sascha Ossowski

Adaptation and Validation of an Agent Model of Functional State and Performance for Individuals .................... 595
Fiemke Both, Mark Hoogendoorn, S. Waqar Jaffry, Rianne van Lambalgen, Rogier Oorburg, Alexei Sharpanskykh, Jan Treur, and Michael de Vos

A Cooperation Trading Method with Hybrid Traders .................. 608
Satoshi Takahashi and Tokuro Matsuo

GPGCloud: Model Sharing and Execution Environment Service for Simulation of International Politics and Economics ........ 616
Yoshiki Kato, Hirofumi Yamaki, and Yuki Asai
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creating and Using Reputation-Based Agreements in Organisational</td>
<td>624</td>
</tr>
<tr>
<td>Environments</td>
<td></td>
</tr>
<tr>
<td><em>Roberto Centeno, Ramón Hermoso, and Viviane Torres da Silva</em></td>
<td></td>
</tr>
<tr>
<td>Directory Service in the Language Grid for System Integration</td>
<td>632</td>
</tr>
<tr>
<td><em>Daisuke Yanagisawa, Takuya Furuta, and Hirofumi Yamaki</em></td>
<td></td>
</tr>
<tr>
<td>SBDO: A New Robust Approach to Dynamic Distributed Constraint</td>
<td>641</td>
</tr>
<tr>
<td>Optimisation</td>
<td></td>
</tr>
<tr>
<td><em>Graham Billiau and Aditya Ghose</em></td>
<td></td>
</tr>
<tr>
<td>Evacuation Planning Assist System with Network Model-Based</td>
<td>649</td>
</tr>
<tr>
<td>Pedestrian Simulator</td>
<td></td>
</tr>
<tr>
<td><em>Tomohisa Yamashita, Shunsuke Soeda, and Itsuki Noda</em></td>
<td></td>
</tr>
<tr>
<td><strong>Author Index</strong></td>
<td>657</td>
</tr>
</tbody>
</table>