

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Switzerland

John C. Mitchell

Stanford University, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz

University of Bern, Switzerland

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

University of Dortmund, Germany

Madhu Sudan

Massachusetts Institute of Technology, MA, USA

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Moshe Y. Vardi

Rice University, Houston, TX, USA

Gerhard Weikum

Max-Planck Institute of Computer Science, Saarbruecken, Germany

Jingshan Huang Ryszard Kowalczyk
Zakaria Maamar David Martin
Ingo Müller Suzette Stoutenburg
Katia P. Sycara (Eds.)

Service-Oriented Computing: Agents, Semantics, and Engineering

AAMAS 2007 International Workshop, SOCASE 2007
Honolulu, HI, USA, May 14, 2007
Proceedings

Volume Editors

Jingshan Huang

University of South Carolina, Columbia, SC 29208, USA

E-mail: huang27@sc.edu

Ryszard Kowalczyk

Swinburne University of Technology, Hawthorn, VIC 3122, Australia

E-mail: rkowalczyk@ict.swin.edu.au

Zakaria Maamar

Zayed University, PO Box 19282, Dubai, United Arab Emirates

E-mail: zakaria.maamar@zu.ac.ae

David Martin

SRI International, Menlo Park, CA 94025-3493, USA

E-mail: martin@ai.sri.com

Ingo Müller

Swinburne University of Technology, Hawthorn, VIC 3122, Victoria, Australia

E-mail: imueller@ict.swin.edu.au

Suzette Stoutenburg

The MITRE Corporation, Colorado Springs, Colorado 80910, USA

E-mail: suzette@mitre.org

Katia P. Sycara

Carnegie Mellon University, Pittsburgh, PA. 15213, USA

E-mail: katia@cs.cmu.edu

Library of Congress Control Number: 2007927059

CR Subject Classification (1998): H.3.5, H.3.3, H.3-4, I.2, C.2.4

LNCS Sublibrary: SL 3 – Information Systems and Application,
incl. Internet/Web and HCI

ISSN 0302-9743

ISBN-10 3-540-72618-7 Springer Berlin Heidelberg New York

ISBN-13 978-3-540-72618-0 Springer Berlin Heidelberg New York

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.

Springer is a part of Springer Science+Business Media

springer.com

© Springer-Verlag Berlin Heidelberg 2007

Printed in Germany

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

Printed on acid-free paper SPIN: 12066605 06/3180 5 4 3 2 1 0

Preface

The global trend towards more flexible and dynamic business process integration and automation has led to a convergence of interests between service-oriented computing, semantic technology, and intelligent multiagent systems. In particular the areas of service-oriented computing and semantic technology offer much interest to the multiagent system community, including similarities in system architectures and provision processes, powerful tools, and the focus on issues such as quality of service, security, and reliability. Similarly, techniques developed in the multiagent systems and semantic technology promise to have a strong impact on the fast-growing service-oriented computing technology.

Service-oriented computing has emerged as an established paradigm for distributed computing and e-business processing. It utilizes services as fundamental building blocks to enable the development of agile networks of collaborating business applications distributed within and across organizational boundaries. Services are self-contained, platform-independent software components that can be described, published, discovered, orchestrated, and deployed for the purpose of developing distributed applications across large heterogeneous networks such as the Internet.

Multiagent systems are also aimed at the development of distributed applications, however, from a different but complementary perspective. Service-oriented paradigms are mainly focused on syntactical and declarative definitions of software components, their interfaces, communication channels, and capabilities with the aim of creating interoperable and reliable infrastructures. In contrast, multiagent systems center on the development of reasoning and planning capabilities of autonomous problem solvers that apply behavioral concepts such as interaction, collaboration, or negotiation in order to create flexible and fault-tolerant distributed systems for dynamic and uncertain environments.

Semantic technology offers a semantic foundation for interactions among agents and services, forming the basis upon which machine-understandable service descriptions can be obtained, and as a result, autonomic coordination among agents is made possible. On the other hand, ontology-related technologies, ontology matching, learning, and automatic generation, etc., not only gain in potential power when used by agents, but also are meaningful only when adopted in real applications in areas such as service-oriented computing.

This volume consists of the proceedings of the Service-Oriented Computing: Agents, Semantics, and Engineering (SOCASE 2007) workshop held at the International Joint Conferences on Autonomous Agents and Multiagent Systems (AAMAS 2007). It also includes the four best papers selected from the Service-Oriented Computing and Agent-Based Engineering (SOCABE 2006) workshop held at AAMAS 2006. The papers in this volume cover a range of topics at the intersection of service-oriented computing, semantic technology, and intelligent

multiagent systems, such as: service description and discovery; planning, composition and negotiation; semantic processes and service agents; and applications.

The workshop organizers would like to thank all members of the Program Committee for their excellent work, effort, and support in ensuring the high-quality program and successful outcome of the SOCASE 2007 workshop. We would also like to thank Springer for their cooperation and help in putting this volume together.

May 2007

Jingshan Huang
Ryszard Kowalczyk
Zakaria Maamar
David Martin
Ingo Müller
Suzette Stoutenburg
Katia Sycara

Organization

SOCASE 2007 was held in conjunction with The Sixth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS 2007) on May 14, 2007 at the Hawaii Convention Center in Honolulu, Hawaii.

Organizing Committee

Jingshan Huang, University of South Carolina, USA
Ryszard Kowalczyk, Swinburne University of Technology, Australia
Zakaria Maamar, Zayed University Dubai, United Arab Emirates
David Martin, SRI International, USA
Ingo Müller, Swinburne University of Technology, Australia
Suzette Stoutenburg, The MITRE Corporation, USA
Katia Sycara, Carnegie Mellon University, USA

Program Committee

Esma Aimeur, University of Montreal, Canada
Stanislaw Ambroszkiewicz, Polish Academy of Sciences, Poland
Yacine Atif, United Arab Emirates University, United Arab Emirates
Youcef Baghdadi, Sultan Qaboos University, Oman
Djamal Benslimane, Université Claude Bernard Lyon 1, France
Jamal Bentahar, Concordia University Montreal, Canada
M. Brian Blake, Georgetown University, USA
Peter Braun, the agent factory GmbH, Germany
Paul A. Buhler, College of Charleston, USA
Bernard Burg, Panasonic Research, USA
Jiangbo Dang, Siemens Corporate Research, USA
Ian Dickinson, HP Laboratories Bristol, UK
Chirine Ghedira, Université Claude Bernard Lyon 1, France
Karthik Gomadam, University of Georgia, USA
Slimane Hammoudi, ESEO, France
Jingshan Huang, University of South Carolina, USA
Patrick Hung, University of Ontario, Canada
Nafaâ Jabeur, University of Windsor, Canada
Jugal Kalita, University of Colorado at Colorado Springs, USA
Mikko Laukkanen, TeliaSonera, Finland
Sandy Liu, NRC Institute for Information Technology, USA
Peter Mork, The MITRE Corporation, USA
Nanjangud C. Narendra, IBM India Research Lab, India
Manuel Núñez García, Universidad Complutense de Madrid, Spain

VIII Organization

Leo Obrst, The MITRE Corporation, USA
Julian A. Padget, University of Bath, UK
Terry Payne, University of Southampton, UK
Giovanna Petrone, Universita' di Torino, Italy
Debbie Richards, Macquarie University, Australia
Marwan Sabbouh, The MITRE Corporation, USA
Quan Z. Sheng, The University of Adelaide, Australia
Pavel Shvaiko, University of Trento, Italy
Suzette Stoutenburg, The MITRE Corporation, USA
Eleni Stroulia, University of Alberta, Canada
Jie Tang, Tsinghua University, China
Philippe Thiran, University of Namur, Belgium
Huaglory Tianfield, Caledonian University Glasgow, UK
Willem-Jan van den Heuvel, Tilburg University, The Netherlands
Kunal Verma, Accenture Technology Labs Palo Alto, USA
Steve Wilmott, Universitat Politecnica de Catalunya, Spain
Soe-Tsyrr Yuan, National Chengchi University Taipei, Taiwan

Table of Contents

Executing Semantic Web Services with a Context-Aware Service Execution Agent	1
<i>António Luís Lopes and Luís Miguel Botelho</i>	
An Effective Strategy for the Flexible Provisioning of Service Workflows	16
<i>Sebastian Stein, Terry R. Payne, and Nicholas R. Jennings</i>	
Using Goals for Flexible Service Orchestration	31
<i>M. Birna van Riemsdijk and Martin Wirsing</i>	
An Agent-Based Approach to User-Initiated Semantic Service Interconnection	49
<i>Nicolas Braun, Richard Cissé, and Sahin Albayrak</i>	
A Lightweight Agent Fabric for Service Autonomy	63
<i>Yu-Fei Ma, Hong Xia Li, and Pei Sun</i>	
Semantic Service Composition in Service-Oriented Multiagent Systems: A Filtering Approach	78
<i>Alberto Fernández and Sascha Ossowski</i>	
Towards a Mapping from BPMN to Agents	92
<i>Holger Endert, Benjamin Hirsch, Tobias Küster, and Sahin Albayrak</i>	
Associated Topic Extraction for Consumer Generated Media Analysis	107
<i>Shinichi Nagano, Masumi Inaba, Yumiko Mizoguchi, and Takahiro Kawamura</i>	
An MAS Infrastructure for Implementing SWSA Based Semantic Services	118
<i>Önder Gürçan, Geylani Kardas, Özgür Gümüş, Erdem Eser Ekinci, and Oguz Dikenelli</i>	
A Role-Based Support Mechanism for Service Description and Discovery	132
<i>Alberto Fernández, Matteo Vasirani, César Cáceres, and Sascha Ossowski</i>	
WS2JADE: Integrating Web Service with Jade Agents	147
<i>Xuan Thang Nguyen and Ryszard Kowalczyk</i>	

Z-Based Agents for Service Oriented Computing	160
<i>Ioan Alfred Letia, Anca Marginean, and Adrian Groza</i>	
Author Index	175