

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

TU Dortmund University, Germany

Madhu Sudan

Microsoft Research, Cambridge, 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 for Informatics, Saarbruecken, Germany

Ngoc Thanh Nguyen (Ed.)

Transactions on Computational Collective Intelligence VII

Volume Editor

Ngoc Thanh Nguyen
Wroclaw University of Technology
Wyb. Wyspiańskiego 27
50-370 Wroclaw, Poland
E-mail: ngoc-thanh.nguyen@pwr.edu.pl

ISSN 0302-9743 (LNCS)

e-ISSN 1611-3349 (LNCS)

ISSN 2190-9288 (TCCI)

ISBN 978-3-642-32065-1

e-ISBN 978-3-642-32066-8

DOI 10.1007/978-3-642-32066-8

Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2012942489

CR Subject Classification (1998):

I.2.11, H.3.4, I.2.6, H.3, H.4, H.5, I.2, D.2, K.4.4, G.1.2, F.1.1

© 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)

Transactions on Computational Collective Intelligence VII

Preface

Welcome to the seventh volume of *Transactions on Computational Collective Intelligence* (TCCI). This is the second issue in 2012.

As a journal, TCCI is indexed by major databases such as ISI Web of Science, EI Engineering Index, ACM Digital Library, DBLP, and Scopus. Moreover, we are pleased to report that TCCI has been selected to be included in the Excellence in Research for Australia (ERA) 2012 Journal List, Australian Research Council.

This volume of TCCI includes ten interesting and original papers that have been selected after a peer-review process.

The first paper, entitled “The Process of Reaching Agreement in Meaning Negotiation” by Elisa Burato and Matteo Cristani, presents an approach for the problem of defining a general framework that can be used to formalize the steps that brings a group of agents to reach an agreement about the meaning of a set of terms. In particular, the authors worked out an algorithm which automates the meaning negotiation process.

In the second paper, “Formalizing Emotional E-Commerce Agents for a Simple Negotiation Protocol,” the authors, Veronica Jascanu, Nicolae Jascanu and Severin Bumbaru, address the emotional e-commerce problem. They built a platform for its solution by formalizing the customer, supplier and community agents. A simple negotiation protocol as a proof of concept is also presented.

The next paper, “Engineering Multi-Agent Systems Through Statecharts-Based JADE Agents and Tools” by Giancarlo Fortino, Francesco Rango and Wilma Russo, includes a framework and a related tool supporting a Statecharts-based development of JADE-based MAS. In particular, a model for programming JADE behaviors through a variant of the Statecharts, named Distilled StateCharts (DSCs), has been developed by enhancing the JADE add-on HSM Behavior.

In the fourth paper entitled “Fleet Organization Models for Online Vehicle Routing Problems” the authors, Mahdi Zargayouna and Besma Zeddini, address online vehicle routing problems with time windows. They proposed two agent-oriented models which enable a particular dynamic organization of the vehicles with the objective to minimize the appearance of such areas. The first model deals with a spatial representation of the agents’ action zones, and the second is grounded on the space-time representation of these zones.

In “Neural Smooth Function Approximation and Prediction with Adaptive Learning Rate” by Villèvo Adanhounmè, Théophile K. Dagba, and Sèmiyou A. Adédjouma, an algebraic approach for representing multidimensional and non-linear functions by feedforward neural networks implemented for the approximation of smooth batch data containing the input-output of hidden neurons and the final neural output of the network is presented and discussed.

The next paper entitled “A Multi-Classifer Approach to Dialogue Act Classification Using Function Words,” by James O’Shea, Zuhair Bandar and Keeley Crockett, presents a novel technique for the classification of sentences as dialogue acts, which is based on structural information contained in function words. The experiments performed by the authors on classifying questions in the presence of a mix of straightforward and “difficult” non-questions gave very promising results, with classification accuracy equal to almost 90%.

In the seventh paper, “Building Group Recommendations in E-learning Systems” Danuta Zakrzewska presents an agent-based recommender system, which is capable of suggesting to a new student a group of similar profiles and consequently of proposing suitable learning resources for him. The author has performed several tests for real data of different groups of similar students as well as of individual learners.

The next paper, “Individual Semiosis in Multi-agent Systems” by Wojciech Lorkiewicz, Radosław Katarzyniak, and Ryszard Kowalczyk presents research studies on the dynamics of the knowledge alignment processes in multi-agent environments, depending on the internal behavior of agents and the dynamics of the observed phase transition in the alignment process.

The ninth paper entitled “Evaluation of Multi-Agent Systems: Proposal and Validation of a Metric Plan,” by Pierpaolo Di Bitonto, Maria Laterza, Teresa Roselli, Veronica Rossano, presents a method for evaluating static multi-agent systems and its validation. The originality of the method is based on the possibility of the MAS to be evaluated in the context of the environment in which it will operate, and its adequacy for the environment to be judged from the viewpoints of both the designer and the evaluator.

In the last paper, “Egress Modeling Through Cellular Automata-Based Multi-Agent Systems,” Jarosław Wąs presents an analysis of evacuation models based on a multi-agent approaches. This analysis is based on several evacuation experiments carried out by the author and on a practical approach toward the creation of computer simulations using cellular automata-based multi-agent systems.

TCCI is a peer-reviewed and authoritative journal dealing with the working potential of CCI methodologies and applications, as well as emerging issues of interest to academics and practitioners. The research area of CCI has been growing significantly in recent years and we are very thankful to everyone within the CCI research community who has supported the *Transactions on Computational Collective Intelligence* and its affiliated events including the *International*

Conferences on Computational Collective Intelligence (ICCCI). ICCCI 2012 will be held in Ho Chi Minh city, Vietnam, in November 2012. After each event of ICCCI we invite authors of selected papers to extend them and submit for publication in TCCI.

We would like to thank all the authors, Editorial Board members, and the reviewers for their contributions to TCCI. Finally, we would also like to express our gratitude to the LNCS editorial staff of Springer led by Alfred Hofmann for supporting the TCCI journal.

April 2012

Ngoc Thanh Nguyen

Transactions on Computational Collective Intelligence

This Springer journal focuses on research in applications of the computer-based methods of computational collective intelligence (CCI) and their applications in a wide range of fields such as the Semantic Web, social networks and multi-agent systems. It aims to provide a forum for the presentation of scientific research and technological achievements accomplished by the international community.

The topics addressed by this journal include all solutions of real-life problems for which it is necessary to use CCI technologies to achieve effective results. The emphasis of the papers published is on novel and original research and technological advancements. Special features on specific topics are welcome.

Editor-in-Chief

Ngoc Thanh Nguyen

Wroclaw University of Technology, Poland

Co-Editor-in-Chief:

Ryszard Kowalczyk

Swinburne University of Technology, Australia

Editorial Board

John Breslin

National University of Ireland, Galway, Ireland

Shi-Kuo Chang

University of Pittsburgh, USA

Longbing Cao

University of Technology Sydney, Australia

Oscar Cordon

European Centre for Soft Computing, Spain

Tzung-Pei Hong

National University of Kaohsiung, Taiwan

Gordan Jezic

University of Zagreb, Croatia

Piotr Jędrzejowicz

Gdynia Maritime University, Poland

Kang-Hyun Jo

University of Ulsan, Korea

Radosław Katarzyniak

Wroclaw University of Technology, Poland

Jozef Korbicz

University of Zielona Gora, Poland

Hoai An Le Thi

Metz University, France

Pierre Lévy

University of Ottawa, Canada

Tokuro Matsuo

Yamagata University, Japan

Kazumi Nakamatsu

University of Hyogo, Japan

Toyooki Nishida

Kyoto University, Japan

Manuel Núñez

Universidad Complutense de Madrid, Spain

Julian Padget

University of Bath, UK

Witold Pedrycz	University of Alberta, Canada
Debbie Richards	Macquarie University, Australia
Roman Słowiński	Poznan University of Technology, Poland
Edward Szczerbicki	University of Newcastle, Australia
Kristinn R. Thorisson	Reykjavik University, Iceland
Gloria Phillips-Wren	Loyola University Maryland, USA
Sławomir Zadrozny	Institute of Research Systems, PAS, Poland

Table of Contents

The Process of Reaching Agreement in Meaning Negotiation.....	1
<i>Elisa Burato and Matteo Cristani</i>	
Formalizing Emotional E-Commerce Agents for a Simple Negotiation Protocol	43
<i>Veronica Jascanu, Nicolae Jascanu, and Severin Bumbaru</i>	
Engineering Multi-Agent Systems through Statecharts-Based JADE Agents and Tools	61
<i>Giancarlo Fortino, Francesco Rango, and Wilma Russo</i>	
Fleet Organization Models for Online Vehicle Routing Problems	82
<i>Mahdi Zargayouna and Besma Zeddini</i>	
Neural Smooth Function Approximation and Prediction with Adaptive Learning Rate	103
<i>Villèvo Adanhounmè, Théophile K. Dagba, and Sèmiyou A. Adédjouma</i>	
A Multi-classifier Approach to Dialogue Act Classification Using Function Words.....	119
<i>James O'Shea, Zuhair Bandar, and Keeley Crockett</i>	
Building Group Recommendations in E-Learning Systems	144
<i>Danuta Zakrzewska</i>	
Individual Semiosis in Multi-Agent Systems	164
<i>Wojciech Lorkiewicz, Radosław Katarzyniak, and Ryszard Kowalczyk</i>	
Evaluation of Multi-Agent Systems: Proposal and Validation of a Metric Plan	198
<i>Pierpaolo Di Bitonto, Maria Laterza, Teresa Roselli, and Veronica Rossano</i>	
Egress Modeling through Cellular Automata Based Multi-Agent Systems	222
<i>Jarosław Wąs</i>	
Author Index	237