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Computational Collective Intelligence

Technologies and Applications

Third International Conference, ICCCI 2011
Gdynia, Poland, September 21-23, 2011
Proceedings, Part I



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Volume Editors

Piotr Jędrzejowicz
Gdynia Maritime University
Morska 81-87
81-225 Gdynia, Poland
E-mail: pj@am.gdynia.pl

Ngoc Thanh Nguyen
Wrocław University of Technology
Wyb. Wyspińskiego 27
50-370 Wrocław, Poland
E-mail: ngoc-thanh.nguyen@pwr.wroc.pl

Kiem Hoang
University of Information Technology
Km 20, Xa Lo Ha Noi, Linh Trung, Thu Duc
848 HCM City, Vietnam
E-mail: kiemhv@uit.edu.vn

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Preface

Computational Collective Intelligence – Technologies and Applications Third International Conference ICCCI 2011 September 21–23, 2011, Gdynia, Poland

This volume contains the proceedings (Part I) of the Third International Conference on Computational Collective Intelligence (ICCCI 2011) held at Gdynia Maritime University in Poland during September 21–23, 2011. The conference was organized by Gdynia Maritime University in cooperation with Wrocław University of Technology in Poland. The conference was run under the scientific patronage of the Committee of Informatics, Polish Academy of Sciences and the Polish Artificial Intelligence Society.

Following the successes of the First International Conference on Computational Collective Intelligence: Semantic Web, Social Networks and Multiagent Systems (ICCCI 2009) held in Wrocław, Poland, and the Second International Conference on Computational Collective Intelligence (ICCCI 2010) held in Kaohsiung, Taiwan, ICCCI 2011 continued to provide an internationally respected forum for scientific research in the computer-based methods of collective intelligence and their applications.

Computational collective intelligence (CCI) is most often understood as a sub-field of artificial intelligence (AI) dealing with soft computing methods that enable group decisions to be made or knowledge to be processed among autonomous units acting in distributed environments. Methodological, theoretical and practical aspects of CCI are considered as the form of intelligence that emerges from the collaboration and competition of many individuals (artificial and/or natural). The application of multiple computational intelligence technologies such as fuzzy systems, evolutionary computation, neural systems, consensus theory, etc., can support human and other collective intelligence, and create new forms of CCI in natural and/or artificial systems. Three subfields of application of computational intelligence technologies to support various forms of collective intelligence are of special attention but are not exclusive: Semantic Web (as an advanced tool increasing collective intelligence), social network analysis (as the field targeted to the emergence of new forms of CCI), and multiagent systems (as a computational and modeling paradigm especially tailored to capture the nature of CCI emergence in populations of autonomous individuals).

The ICCCI 2011 conference featured a number of keynote talks, oral presentations and invited sessions, closely aligned to the theme of the conference. The conference attracted a substantial number of researchers and practitioners from

all over the world, who submitted their papers for the main track subdivided into ten thematic streams and seven special sessions.

The main track streams, covering the methodology and applications of CCI, include: Machine Learning and Applications, Collective Computations and Optimization, Web Services and Semantic Web, Social Networks, Complex Systems and Intelligent Applications, Ontology Management, Knowledge Management, Agents and Multiagent Systems, Mobile Agents and Robotics, Modeling, Simulation and Decision Making, Applications of Computational Collective Intelligence in Shipping. The special sessions, covering some specific topics of particular interest, include: Computational Collective Intelligence in Bioinformatics, Computational Collective Intelligence-Based Optimization Models, Autonomous and Collective Decision-Making, Collective Intelligence in Web Systems, Web Systems Analysis, Computational Swarm Intelligence and Applications, Computational Swarm Intelligence, Discovering Relationships in Data, and finally, Computational Collective Intelligence in Economy.

We received almost 300 submissions from over 25 countries. Each paper was reviewed by two to four members of the International Program Committee and International Reviewer Board. Only 109 best papers were selected for oral presentation and publication in the two volumes of the ICCCI 2011 proceedings.

We would like to express our sincere thanks to the Honorary Patrons: the Mayor of Gdynia, Wojciech Szczurek, the Rector of Gdynia Maritime University, Romuald Cwilewicz, and the Rector of Wrocław University of Technology, Tadeusz Więckowski. Our special gratitude goes to the Honorary Chairs, Pierre Lévy from the University of Ottawa, Canada, and Roman Słowiński from Poznań University of Technology, Poland, for their support.

We would also like to express our thanks to the Keynote Speakers: Jeng-Shyang Pan, Leszek Rutkowski, Edward Szczerbicki and Jan Treur, for their interesting and informative talks of world-class standard. We also thank our partners, University of Information Technology (Vietnam), National Taichung University of Education (Taiwan), and Academic Computer Centre in Gdansk (Poland), for their kind support.

Special thanks go to the Organizing Chairs (Radosław Katarzyniak and Dariusz Barbucha) for their efforts in the organizational work. Thanks are due to the Program Co-chairs, Program Committee and the Board of Reviewers, essential for reviewing the submissions to ensure the high quality of accepted papers. We also thank the members of the Local Organizing Committee, Publicity Chairs and Special Sessions Chairs.

Finally, we cordially thank all the authors, presenters and delegates for their valuable contribution to this successful event. The conference would not have been possible without their support.

It is our pleasure to announce that the ICCCI conference series is closely cooperating with the Springer journal *Transactions on Computational Collective Intelligence* and the IEEE SMC Technical Committee on *Transactions on Computational Collective Intelligence*.

We hope that ICCCI 2011 significantly contributed to the fulfillment of the academic excellence, leading to even more successful of ICCCI events in the future.

September, 2011

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Rough-Neuro-Fuzzy-Genetic Hybrid Intelligent Systems

Edward Szczerbicki
The University of Newcastle, Australia
Experiential Decisional DNA

Jan Treur
VU University Amsterdam, The Netherlands
From Mirroring to the Emergence of Shared Understanding and Collective Power

Special Sessions

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2. *CCI-Based Optimization Models (CCIBOM 2011)*

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Dariusz Barbucha	Gdynia Maritime University, Poland

3. *Autonomous and Collective Decision-Making (ACDM 2011)*

Amine Chohra	Paris-East University, France
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4. *Collective Intelligence in Web Systems—Web Systems Analysis (WebSys 2011)*

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5. *Computational Collective Intelligence in Economy (CCIE 2011)*

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7. *Computational Swarm Intelligence—Discovering Relationships in Data (CSI 2011)*

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