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Computational Collective Intelligence

Technologies and Applications

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Computational Collective Intelligence – Technologies and Applications 6^{th} International Conference ICCCI 2014

Preface

This volume contains the proceedings of the 6^{th} International Conference on Computational Collective Intelligence (ICCCI 2014) held in Seoul, Korea, September 24-26, 2014. The conference was co-organized by Wrocław University of Technology (Poland), Yeungnam University, Hanyang University and Dankook University (Korea). The conference was run under the patronage of the IEEE SMC Technical Committee on Computational Collective Intelligence.

Following the successes of the 1^{st} ICCCI (2009) held in Wrocław, Poland, the 2^{nd} ICCCI (2010) in Kaohsiung, Taiwan, the 3^{rd} ICCCI (2011) in Gdynia, Poland, the 4^{th} ICCCI (2012) in Ho Chi Minh city, Vietnam, and the 5^{th} ICCCI (2013) in Craiova, Romania, this conference 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 making group decisions or processing knowledge among autonomous units acting in distributed environments. Methodological, theoretical, and practical aspects of computational collective intelligence 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 2014 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 10 thematic streams and 3 special sessions.

The main track streams, covering the methodology and applications of computational collective intelligence, included: knowledge integration, data mining for collective processing, fuzzy, modal and collective systems, nature inspired systems, language processing systems, social networks and semantic web, agent and multi-agent systems, classification and clustering methods, multi-dimensional data processing, web systems, intelligent decision making, methods for scheduling, image and video processing.

The special sessions, covering some specific topics of particular interest, included: collective intelligence in web systems, computational swarm intelligence, and cooperation and collective knowledge.

We received in total 205 submissions from 23 countries. Each paper was reviewed by 2-4 members of the International Program Committee and International Reviewer Board. Only 70 best papers have been selected for oral presentation and publication in the volume of the Lecture Notes in Artificial Intelligence series.

We would like to express our sincere thanks to the honorary chairs, Philip S. Yu, Pierre Lévy, Jin Hyung Kim, and Tadeusz Więckowski for their support.

We also would like to express our thanks to the keynote speakers - Francis Heylighen (Belgium), Il-Hong Suh (Korea), and Mirjana Ivanović (Serbia), for their world-class plenary speeches.

Special thanks go to the organizing chair, Dosam Hwang for his efforts in the organizational work. Thanks are due to the program co-chairs, Program Committee and the Board of Reviewers, essential for reviewing the papers to ensure the high quality of accepted papers. We thank the publicity chairs, special sessions chairs and the members of the Local Organizing Committee.

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

It is our pleasure to announce that the conferences of ICCCI series are 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 and intend that ICCCI 2014 significantly contributes to fulfillment of the academic excellence and leads to even greater successes of ICCCI events in the future.

September 2014

Dosam Hwang
Jason J. Jung
Ngoc Thanh Nguyen

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Special Sessions

CI4BC 2014: 2nd International Workshop on Computational Intelligence for Business Collaboration
Organizers: Jason J. Jung and Huu-Hanh Hoang

WebSys'2014: Collective Intelligence in Web Systems - Web Systems Analysis
Organizers: Kazimierz Choroś and Maria Trocan

CompStory14: The First International Symposium on Computational Story
Organizers: Seung-Bo Park, Eun-Soon Yoo and Jason J. Jung

FMADIS 2014: The 1st International Workshop on "Frontier Management and Intelligent Decision Support for Highly Ill-Structured Decision Problems
Organizers: Kun Chang Lee

CSI 2014: Computational Swarm Intelligence - High Effectiveness and Pick Efficiency in Optimization
Organizers: Urszula Boryczka

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