

Preface

This volume contains the proceedings of the 7th International Conference on Computational Collective Intelligence (ICCCI 2015), held in Madrid, Spain, September 21–23, 2015. The conference was co-organized by the Universidad Complutense de Madrid, Spain, the Universidad Autónoma de Madrid, Spain, and Wrocław University of Technology, Poland. The conference was run under the patronage of the IEEE SMC Technical Committee on Computational Collective Intelligence.

Following the successes of the 1st ICCCI (2009) held in Wrocław, Poland, the 2nd ICCCI (2010) in Kaohsiung, Taiwan, the 3rd ICCCI (2011) in Gdynia, Poland, the 4th ICCCI (2012) in Ho Chi Minh City, Vietnam, the 5th ICCCI (2013) in Craiova, Romania, and the 6th ICCCI (2014) in Seoul, South Korea, 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 the application of computational intelligence technologies to support various forms of collective intelligence are of special interest but are not exclusive: Semantic Web (as an advanced tool for 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 2015 conference featured a number of keynote talks and oral presentations, 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 and 10 special sessions.

The main track, 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; and image and video processing.

The special sessions, covering some specific topics of particular interest, included: Collective Intelligence in Web Systems - Web Systems Analysis, Computational Swarm Intelligence, Cooperative Strategies for Decision Making and Optimization, Advanced Networking and Security Technologies, IT in Biomedicine, Collective Computational Intelligence in an Educational Context, Science Intelligence and Data Analytics, Computational Intelligence in Financial Markets, Ensemble Learning, and Big Data Mining and Searching.

We received in total 186 submissions. Each paper was reviewed by 2–4 members of the International Program Committee of either the main track or one of the special sessions. We selected the 110 best papers for oral presentation and publication in two volumes of the Lecture Notes in Artificial Intelligence series.

We would like to express our thanks to the keynote speakers, Francisco Herrera, B. John Oommen, Guy Theraulaz, and Jorge Ufano, for their world-class plenary speeches. Many people contributed towards the success of the conference. First, we would like to recognize the work of the Program Committee Co-chairs and special sessions organizers for taking good care of the organization of the reviewing process, an essential stage in ensuring the high quality of the accepted papers. The Workshops and Special Sessions Chairs deserve a special mention for the evaluation of the proposals and the organization and coordination of the work of the 10 special sessions. In addition, we would like to thank the PC members, of the main track and of the special sessions, for performing their reviewing work with diligence. We thank the Organizing Committee Chairs, Liaison Chairs, Publicity Chair, Special Issues Chair, Financial Chair, Web Chair, and Technical Support Chair for their fantastic work before and during the conference. 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 conferences of ICCCI series continue a close cooperation with the Springer journal Transactions on Computational Collective Intelligence, and the IEEE SMC Technical Committee on Transactions on Computational Collective Intelligence.

Finally, we hope and intend that ICCCI 2015 significantly contributes to the academic excellence of the field and leads to the even greater success of ICCCI events in the future.

September 2015

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Computational Collective Intelligence

7th International Conference, ICCCI 2015, Madrid,
Spain, September 21-23, 2015, Proceedings, Part II

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(Eds.)

2015, XXII, 661 p. 220 illus., Softcover

ISBN: 978-3-319-24305-4