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Advances in Computational Collective Intelligence

15th International Conference, ICCCI 2023 Budapest, Hungary, September 27–29, 2023 Proceedings

Springer

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Preface

This volume contains the second part of the proceedings of the 15th International Conference on Computational Collective Intelligence (ICCCI 2023), held in Budapest, Hungary between 27–29 September 2023. The conference was organized in a hybrid mode which allowed for both on-site and online paper presentations. The conference was hosted by the Eötvös Loránd University (ELTE), Hungary and jointly organized by Wrocław University of Science and Technology, Poland in cooperation with IEEE SMC Technical Committee on Computational Collective Intelligence, European Research Center for Information Systems (ERCIS), International University-VNU-HCM (Vietnam) and John von Neumann Computer Society (NJSZT).

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, the 6th ICCCI (2014) in Seoul - South Korea, the 7th ICCCI (2015) in Madrid - Spain, the 8th ICCCI (2016) in Halkidiki - Greece, the 9th ICCCI (2017) in Nicosia - Cyprus, the 10th ICCCI (2018) in Bristol - UK, the 11th ICCCI (2019) in Hendaye - France, the 12th ICCCI (2020) in Da Nang - Vietnam, the 13th ICCCI (2021) in Rhodes - Greece, and the 14th ICCCI (2022) in Hammamet - Tunisia, this conference continued to provide an internationally respected forum for scientific research in computer-based methods of collective intelligence and their applications.

Computational collective intelligence (CCI) is most often understood as a subfield of artificial intelligence (AI) dealing with soft computing methods that facilitate group decisions or processing knowledge 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 the application of computational intelligence technologies to support various forms of collective intelligence are of special interest but are not exclusive: the Semantic Web (as an advanced tool for increasing collective intelligence), social network analysis (as a field targeted at the emergence of new forms of CCI), and multi-agent systems (as a computational and modeling paradigm especially tailored to capture the nature of CCI emergence in populations of autonomous individuals).

The ICCCI 2023 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 9 special sessions.

The main track, covering the methodology and applications of CCI, included: collective decision-making, data fusion, deep learning techniques, natural language processing,

data mining and machine learning, social networks and intelligent systems, optimization, computer vision, knowledge engineering and application, as well as Internet of Things: technologies and applications. The special sessions, covering some specific topics of particular interest, included: cooperative strategies for decision making and optimization, artificial intelligence, speech communication, IOT applications, natural language processing, deep learning, intelligent systems, machine learning, collective intelligence in medical applications and computer vision.

We received 218 papers submitted by authors coming from 41 countries around the world. Each paper was reviewed by at least three members of the international Program Committee (PC) of either the main track or one of the special sessions; reviews were single blind. Finally, we selected 63 papers for oral presentation and publication in one volume of the Lecture Notes in Artificial Intelligence series and 59 papers for oral presentation and publication in one volume of the Communications in Computer and Information Science series.

We would like to express our thanks to the keynote speakers: Loo Chu Kiong from Universiti Malaya (Malaysia), A.E. Eiben from Vrije Universiteit Amsterdam (The Netherlands), Aleksander Byrski from AGH University of Science and Technology (Poland), and Diego Paez-Granados from ETH Zürich (Switzerland).

Many people contributed toward the success of the conference. First, we would like to recognize the work of the PC 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 workshop and special session chairs deserve a special mention for the evaluation of the proposals and the organization and coordination of the work of 9 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 Local Organizing Committee chairs, Publicity chairs, Web chair, and Technical Support chairs 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.

Our special thanks are also due to Springer for publishing the proceedings and to all the other sponsors for their kind support.

It is our pleasure to announce that the ICCCI conference series continues to have 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 that ICCCI 2023 contributed significantly to the academic excellence of the field and will lead to the even greater success of ICCCI events in the future.

September 2023

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