

## PREFACE TO THE SPECIAL ISSUE ON INTELLIGENT DISTRIBUTED COMPUTING

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We are honored and pleased to open this special issue of the Computing and Informatics journal focused on intelligent distributed computing.

Intelligent distributed computing (IDC) faces the challenges of adapting and combining research results in the fields of intelligent computing and distributed computing. Intelligent computing develops methods and technology ranging from classical artificial intelligence, computational intelligence and multi-agent systems to game theory. Distributed computing develops methods and technology to build systems that are composed of collaborating components deployed on computer networks. IDC sets the foundation for development of a new generation of intelligent distributed systems.

One direction of IDC is the application of nature-inspired computing methods like swarm intelligence and genetic algorithms to develop better distributed systems. On the other hand, distributed systems can help to develop more efficient systems that employ the metaphor of bio-inspiration for solving computationally difficult problems. Another direction of IDC proposes the use of intelligent software agents for the development of open and scalable distributed systems that can engage in complex intelligent processes. Intelligent software agents are endowed with high-level properties including knowledge and reasoning that make them appealing for building intelligent distributed systems.

This special issue brings to the reader new research results and applications of intelligent distributed computing, with a special focus on the synergies between

intelligent software agents and bio-inspired technologies on one side and parallel and distributed computing on the other side. In particular, some of the papers address interesting applications of intelligent distributed approaches in the areas of trust, security, protein structure prediction, and Semantic Web Services. We believe that the papers selected for presentation in this special issue will be a valuable resource for researchers and practitioners working in the emergent field of IDC, with a special focus for those especially interested in the recent advancements of the aforementioned research areas that are part of IDC.

This issue includes extended versions of selected papers from the 7<sup>th</sup> International Symposium on Intelligent Distributed Computing (IDC 2013) held on September 3–5, 2013, Prague, Czech Republic. IDC '2013 was collocated with:

- 5<sup>th</sup> International Workshop on Multi-Agent Systems Technology and Semantics, MASTS '2013;
- 2<sup>nd</sup> International Workshop on Agents for Cloud, A4C '2013;
- 1<sup>st</sup> International Workshop on Intelligent Robots, iR '2013.

There were 54 papers from 19 countries submitted to IDC 2013 from which only 25 were accepted and included in the proceedings. From the accepted papers, related to the topic of Intelligent Distributed Computing, 13 papers with higher review scores were selected and invited to be extended and submitted to this special issue. Finally, after two peer-review rounds, 11 of them were carefully revised, extended and improved, thus being judged acceptable for inclusion in this special issue.

We would like to thank the authors of the papers for preparing extended versions of their conference papers and the reviewers for their great job that assured a high quality of the final articles. Also, we would like to thank Dr. Jakub Yaghub for co-organizing IDC 2013, whose high scientific quality standard enabled this special issue. Finally, we would like to express our appreciation to Prof. Ladislav Hluchy, Editor-in-Chief of the Computing and Informatics, for offering us the opportunity to edit this exciting special issue. We really hope that readers of this issue will find the articles quite interesting and inspiring.

### **Reviewers of the Special Issue**

- Costin Badica, University of Craiova, Romania
- Nick Bassiliades, Aristotle University of Thessaloniki, Greece
- David Bednarek, Charles University in Prague, Czech Republic
- Doina Bein, Pennsylvania State University, USA
- Marius Brezovan, University of Craiova, Romania
- Jorge Gomez-Sanz, Complutense University of Madrid, Spain
- Jason J. Jung, Yeungnam University, Republic of Korea
- Igor Kotenko, Russian Academy of Sciences, Russia

- Dariusz Krol, Bournemouth University, UK
- Florin Leon, Technical University “Gheorghe Asachi” of Iasi, Romania
- Giuseppe Mangioni, University of Catania, Italy
- Mihaela Oprea, University Petrol-Gaze of Ploiesti, Romania
- Dana Petcu, Western University of Timisoara, Romania
- Ioan Salomie, Technical University of Cluj-Napoca, Romania
- Florin Pop, University Politehnica of Bucharest, Romania
- Salvatore Venticquique, Second University of Napoli, Italy
- Jakub Yaghob, Charles University in Prague, Czech Republic



**Filip ZAVORAL** is the vice-head of the Department of Software Engineering, Charles University in Prague, Czech Republic. His research interests include distributed and parallel technologies, cloud computing and efficient data processing. He was involved in many national and international research projects. He has co-authored more than 60 research publications such as journal papers, conference proceedings papers, book chapters, and editorials of journal special issues. He is a member of editorial boards of several international journals and he worked as a member of Program Committees and of International Conference Organizing Committees.



**Costin BĂDICĂ** is Professor at the Department of Computers and Information Technology, University of Craiova since 2006. In 2001 and 2002 he was a post-doctoral researcher at the Department of Computer Science, King’s College London, United Kingdom. His research interests are focused to the intersection of artificial intelligence, distributed systems and software engineering. He was involved in many national and international research projects. He coordinates the “Intelligent Distributed Systems” research group (<http://ids.software.ucv.ro>). He has co-authored more than 100 research publications such as journal papers and conference proceedings papers; he has co-edited books, book chapters, and editorials for journal special issues. He is a member of editorial boards of several international journals and he worked as a member of the Program Committees and of International Conference Organizing Committees.