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## Editorial

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**Biographical notes:** David Camacho is currently working as an Associate Professor in the Computer Science Department at Universidad Autonoma de Madrid (Spain). He has published over 100 journals, books, and conference papers. His research interests include multi-agent systems, videogames and virtual worlds, data mining (evolutionary computation, and clustering methods) and semantic web technologies. He is currently involved in several research projects related to videogames, virtual worlds, data analysis and advanced clustering techniques. He is currently the Head of the Applied Intelligence and Data Analysis (AIDA) Group.

Costin Bădică is currently working as a Professor in the Department of Software Engineering, Faculty of Automatics, Computers and Electronics of the University of Craiova, Romania. During 2001 and 2002, he was a Post-Doctoral Fellow with the Department of Computer Science, King's College London, UK. His research interests are at the intersection of artificial intelligence, distributed systems and software engineering. He co-initiated and he is coorganising the intelligent distributed computing – IDC series of international conferences that is being held yearly.

Doina Bein is a Research Associate (faculty) in the Applied Research Laboratory at the Pennsylvania State University. Her past and current research had focused on energy-efficient wireless networks as well as self-organising ad hoc networks, wave algorithms, graph embedding schemes, and fault tolerant distributed algorithms. She tackled a number of important problems in the area of efficient routing and broadcasting in wireless networks, fault tolerant coverage and fault tolerant data structures. She has published two book chapters, 16 journal and over 40 conference papers. Over the last three years, she has worked on dynamic network topology adaptation for heterogeneous data fusion, energy-efficient communication on wireless networks, channel allocation and broadcasting in wireless networks autonomous decision making for adaptive sensing and resource allocation in a sensor network.

Martijn Warnier is an Assistant Professor in the Systems Engineering Section within the Faculty of Technology, Policy and Management, Delft University of Technology. He received his PhD in Computer Science from the Radboud University Nijmegen. After focusing on security of embedded systems, his current research is on self-management of large scale distributed systems, in particular on security aspects involved. He has studied security in many areas with a specific interest for robust systems in highly dynamic environments.

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Distributed systems are currently facing new challenges of adapting and reusing research results in the area of intelligent systems. Intelligent systems are using methods and technology derived from knowledge-based and computational intelligence. Distributed computing develops methods and technology to build systems that are composed of collaborating components. This special issue focuses on all the aspects covering the roles of knowledge and intelligence in distributed systems, ranging from concepts and theoretical developments to advanced technologies and innovative applications.

The selection process for this issue was twofold: authors of the best papers presented at the 5th International Symposium on Intelligent Distributed Computing (IDC 2011) held in Delft, The Netherlands from October 5–7 were invited to submit extended versions of their papers for presentation in this special issue. Next to these invited papers, an open call was also issued. All submitted papers were peer-reviewed and the best ones were selected for this issue. Selected papers cover some relevant topics related to the scope of IDC conference.

The papers selected and included in this special issue are in the following areas: computational reputation in social networks, constraint-satisfaction in security, computational intelligence for semantic web service composition, and reinforcement learning for video games. All of them are covering topics that show how knowledge and/or intelligence can be applied to enhance and/or improve certain types of distributed systems.

The contribution by Vincenza Carchiolo, Alessandro Longheu, Michele Malgeri and Giuseppe Mangioni entitled ‘Users’ attachment in trust networks: reputation vs. effort’ provides insight into some hidden dynamic aspects of EigenTrust metric related to the process of joining/leaving of agents to/from a network. The authors present experimental results on random and scale-free networks with new agents joining the network and acting such that to maximise their gained trustworthiness while minimising the effort spent to acquire it.

Pedro Salgueiro and Salvador Abreu in their contribution ‘Modelling distributed network attacks with constraints’ show how NeMODE declarative system for Computer Network Intrusion Detection can model and detect distributed network attacks on simulated live network traffic. The authors consider experiments using the sliding network traffic window and several network intrusion signatures. The results shown that detection mechanism are sensitive to the log size, problem size and problem type.

Viorica Rozina Chifu, Cristina Bianca Pop, Ioan Salomie, Dumitru Samuel Suia, Alexandru Niculici, Adela Negrean and Horatiu Jeflea in their work ‘Optimising the semantic web service composition process using bio-inspired methods’ describe the application of cuckoo-inspired and genetics-inspired methods for computing nearly optimal solutions to web service composition problem. The methods are validated with the help of an experimental prototype used for carrying out experiments under various settings. The overall conclusion of the authors was that, based on their experimental results, the cuckoo-inspired algorithm performs better than the genetics-based algorithm.

And finally, the contribution ‘Bootstrapping learning from abstract models in games’ by Purvag Patel, Norman Carver and Shahram Rahimi tackles the well-known problem of low convergence speed in reinforcement learning for a detailed model of the world, which is specifically applied in video games domains. The authors report on results from applying the proposed technique to the classic arcade game asteroids.

Overall, we feel that those extended contributions cover the current state-of-the-art in the area of knowledge and intelligence in distributed systems. We appreciate the effort of the authors of the papers for preparing extended versions of their conference papers and we thank the reviewers for their careful analysis of the submissions that assures the high quality of the final articles included in this special issue.