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## **Editorial**

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Welcome to this special issue of the *International Journal of Advanced Intelligence Paradigms (IJAIP)*. We are pleased to introduce six selected papers presented at North-American Simulation Technology Conference (NASTEC), which is a series of conferences initiated by Eurosis after in-depth discussions with Prof. Mokhtar Beldjehem and North-American soft computing scientists, simulationists, and software practitioners addressing issues regarding the interplays and synergies between soft computing, simulation, software engineering and web-centric computing. *NASTEC 2009* was organised on 26–28 August 2009 at Georgia Tech Global Learning Center, Atlanta, USA. It has attracted simulationists, software practitioners, researchers and practitioners of soft computing and web-centric computing, attendees from academic, industry and government agencies in an exchange of ideas and shared experiences.

The intent of the *NASTEC'2009* event is to nurture the spirit of cooperation and strives to improve the quality of life in this global village through excellence in research and education in the fields of soft computing, simulation, software engineering and web-centric computing at the service and for the benefits of the humankind.

On one hand, *soft computing* as a hybrid methodology aspires to serve as a focal where the latest results in fuzzy logic (FL), evolutionary algorithms (EAs), neural networks (NNs) and machine learning (ML), probabilistic reasoning (PR) and part of chaos theory (CT) are integrated or rather fuzzed together in novel ways in order to transcend the intrinsic limitations of a single discipline, in order to develop intelligent hybrid adaptive systems (neuro-fuzzy, fuzzy-genetic, neuro-genetic, neuro-chaotic and neuro-fuzzy-genetic) that have the ability to learn and improve their behaviour through contact with their dynamic imprecise, random and/or uncertain environments, such systems are 'good' candidates to tackle successfully the building of effective *software tools* for a large class of complex large-scale real world problems of automated decision-making, classification, clustering, diagnosis, scheduling, planning, imagery, control, pattern recognition, vision engineering, computational linguistics, information modelling, information retrieval, data analysis and data mining as well as for resolving hard problems of the ever open agenda of *software engineering* such as software maintenance, evolution, stability, adaptability, quality, reliability, portability, effort and cost prediction and understanding, software measurement, software metrics, software testing, validation and verification, software requirement specification, software design, software reuse, software project management and s.o. Thus, indeed soft computing is a paradigm shift in computing.

On the other hand, *web-centric computing* is becoming more and more pervasive and powerful, with the advent of new exciting concepts, protocols, languages, and technologies such as social software, web services, the semantic web, and AJAX. From a software engineering perspective, the web may be thought of as a computing platform available to develop a large spectrum of web-based applications ranging from web-based simulation, e-learning, e-health, e-commerce, e-business, to e-government. Thus, obviously web-centric computing is indeed a new paradigm in computing. This new class of software systems is emerging, and fostering the evolution of new cooperation paradigms among people. As a result, novel approaches and techniques, new tools and frameworks are needed to address the increasing complexity of these applications. Effective methods for reasoning under uncertainty brought from the hybrid soft computing methodology are vital for realising many aspects of the semantic web vision, but the ability of current-generation web technology to handle uncertainty is extremely limited. *Computer simulation* is being acknowledged as the 'third leg' of scientific

discovery and analysis, along with theory and experimentation. Simulation technology aims at building the ‘software digital factory’. Furthermore, it could provide a ‘good’ candidate methodology for the conception and automatic learning of soft computing systems as well as for engineering and automatic construction of complex large-scale software systems, including complex web-based software systems.

The fields of soft computing, simulation, software engineering and web-centric computing in general have made significant progress; parts of them were reflected in the present special issue. This issue was able to attract top-level and forefront research. The themes centre on novel issues in connection with soft computing, simulation, software engineering, web-centric computing, their interplays and synergies.

We are grateful to a number of people without whom we would not have been able to put this special issue together. They include our NASTEC‘09 IPC and *IJAIP* reviewers for making this special issue possible; they have done an excellent job: we got 4.5 reviews per paper on the average. We are grateful to authors of selected papers who have considered *IJAIP* as the target for their work, and even though we could not accommodate every submission in this issue, we hope that the reviews will be helpful to many people.

We are also grateful to Prof. Lakhmi C. Jain, University of South Australia, the *IJAIP* honorary editor, Prof. Valentina E. Balas, Aurel Vlaicu University of Arad, and Prof. Anca Ralescu, University of Cincinnati the *IJAIP* editors-in-chief and the NASTEC 2009 conference staff for inviting us to guest-edit this journal.