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## Editorial

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## 1 Space-based and situated computing

*Space-based and situated computing* is a new trend of computing gaining momentum in the research community, industry and government initiatives. With the fast development in networking technologies we are witnessing an increasing proliferation of various sorts of mobile and wireless devices spread out in indoor spaces such as houses, schools, hospitals, offices and outdoor spaces such as cities, neighbouring communities, urban and metropolitan areas, university campuses, etc. The presence of large amounts of such small but each time more computationally powerful devices is posing real research and development challenges to finding methods to *integrate* them into living spaces, sharing the space of humans as well as benefiting from them to make our lives better. Thus, each time more the human space (*real world environment* and *humans*) and computing space (*virtual world*) are converging to just one space! In fact, it is this integration that is giving computational devices a *social role*, which is by many seen as new paradigm, as now the interaction is not solely between humans and computers but between humans, computers and the environment.

Space-based and situated computing addresses important research issues related to the development of smart applications from various emerging networking paradigms (e.g., applications based on sensing cities), smart interaction interfaces, service deployment and discovery within spaces, security issues, data gathering from sensor networks, data bases for small computational devices and QoS, among others. Besides traditional users, *new actors* appear: government entities, digital and business organisms, which influence the way space-based and situated systems, are deployed, sensed, made secure, etc. Thus, data protection and use, security and privacy become serious issues!

After the journal launch in mid 2010 year, we are very please to publish this inaugural issue. The issue brings visionary works by experts in the field of space-based and situated computing, the state-of-the-art as well as where we are headed to in the future in the field.

## 2 Contents of this issue

The issue comprises eight papers covering most important topics in space-based and situated computing. The content

of the issue is arranged as follows.

The first paper by Gentile et al. introduces emerging research challenges from human-to-human interaction (HHI) domain. The authors have analysed the convergence of well-established research areas, such as graphical user interfaces, tangible user interfaces, touchless gesture user interfaces, voice user interfaces, and brain computer interfaces into HHI paradigm.

In the second paper, Arase et al. study the importance of mobile internet access and search services for mobile phones provided by search engines. The authors propose systems that reduce the number of operations on inputting a query to a search engine, enable clipping and saving a web content, and assist cooperative web search conducted by multiple mobile users.

Kołodziej and Xhafa in the third paper show how to support situated computing by intelligent multi-agent systems. The authors have identified the situated multi-agent system (SMAS) – for modelling the local relationships between users and objects in the environment. A general concept of the three-layered architecture model for SMAS, the components and properties of situated agents are also presented and analysed.

The fourth paper by Cristea et al. focuses on middleware and architectures for space-based and situated computing. The authors present the state-of-the-art in middleware for situated computing, embedded devices, autonomic space management, proactive services, context awareness, and smart spaces.

In the fifth paper, Pirayesh Sabzevar and Sousa, survey the state-of-the-art in authentication, authorisation, and auditing for ubiquitous computing. The authors bring a vision of invisible security that integrates unobtrusive multi-factor authentication with probabilistic models.

Niewiadomska-Szynkiewicz and Sikora, in the sixth paper, investigate research issues in modelling, simulation and evaluation of self-organising and cooperative networks. The authors survey approaches to wireless transmission and nodes mobility modelling, and describe a novel algorithm for calculating a collision-free motion trajectory for a mobile device in unknown environment.

The seventh paper by Bessis et al. presents a roadmap highlighting the use of next generation emerging technologies for enabling collective computational intelligence in managing disaster situations. The authors

have identified a relevant scenario, which is used to illustrate the model architecture and to detail the proposed roadmap.

In the last paper, Toral et al. provide an overview about modern cooperative intelligent transportation systems equipments and present a distributed application in an urban data network. The authors have exemplified the approach with an application based on an embedded CORBA-compliant middleware layer and several computer vision equipments.

We hope that the reader will share with us the joy of this inaugural issue! We believe that the contributions of this issue will prove useful for researchers and developers in the field as well as will open up the door to further high quality research contributions to be published in the journal. *IJSSC* is committed to adhere to the highest academic quality, to publish timely research results, state-of-the-art papers, and

to inform the research community of space-based and situated computing on new research and development achievements in the field.

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*Dedicated to the memory of my father!*