Editorial

Ioannis E. Anagnostopoulos

Department of Information and Communications Systems Engineering,
University of the Aegean, Karlovasi, Samos, Greece
E-mail: janag@aegean.gr

John W.T. Lee

Department of Computing,
Hong Kong Polytechnic University,
Hung Hom, Kowloon, Hong Kong
E-mail: john.lee@polyu.edu.hk

Biographical notes: Ioannis E. Anagnostopoulos received his Diploma from the Department of Electrical Engineering and Computer Technology, University of Patras, Greece, in 1998, and his PhD from the School of Electrical and Computer Engineering, National Technical University of Athens (NTUA), Greece, in 2004. Currently, he is with the University of the Aegean, at the Department of Information and Communication Systems Engineering, serving as a lecturer. His research interests include internet and web technologies, search and retrieval software methodologies, e-commerce, telecommunication networks and intelligent information systems. He is a member of the technical chamber of Greece, IEEE, IET and ACM.

John W.T. Lee received his BSc from the University of Hong Kong, Hong Kong, the MBA from the University of New South Wales, Australia, and the PhD from the University of Sunderland, UK, in 1972, 1983 and 2000, respectively. He spent 12 years in the computer industry in Hong Kong and Australia before joining the Hong Kong Polytechnic University as an academic in 1986. He is currently an Associate Professor in the Department of Computing in the University. His major research interests include fuzzy sets and systems, machine learning, data mining, and intelligent systems in the internet. He is member of the IEEE, ACM and HKCS. He currently co-chairs the Technical Committee on Intelligent Internet Systems in the IEEE Systems, Man, and Cybernetics Society

We are currently witnessing the remarkable impact of internet on our society. The internet is revolutionising the way we extract, process, use, and disseminate information. The internet also redefines many aspects of our life such as communication, commerce, education, and entertainment.

Parallel to the growth of the internet, sophisticated techniques are emerging to bring intelligence to the internet and its protocols. Many technologies and techniques offer the use of intelligence in internet-based recommendation systems, interactive IP-based multimedia systems, internet/web agents, softbots and other internet-based systems. Although individual methods and programming techniques are constantly being deployed, advanced issues and concepts still need to be developed and studied in the context of applied Internet Intelligence. In this context, researchers need to explore and study the plethora of challenges that emergent intelligent technologies and programming techniques bring to the internet.

This special issue aims to increase the awareness of researchers in the area of intelligent internet-based systems, providing an in-depth investigation on various research and deployment issues, regarding the impact of intelligent methods and programming techniques on internet-based systems. In addition, this special issue examines the performance characteristics of various approaches in internet-based systems, while it is focusing on the development of intelligent methods between different IP and web-based domains. The topics covered are Internet Information and Retrieval Systems, Interactive Multimedia Systems over IP Networks, Multimedia Content Distribution and Management in Internet Television (IPTV), Distributed Computing and Resource Allocation and Agent Communication.

Three out of the five selected papers are the extended version of papers presented at the 4th IFIP Conference on Artificial Intelligence Applications and Innovations (AIAI, 2007) in the special session Intelligent Internet Systems: Emerging Technologies and Applications (IIS-ETA).[1] The papers are presented according to the topics announced in the call for papers of this special issue and their titles are 'User keyword preference: the Nwords and Rwords experiments', 'Intelligent content personalisation in internet TV using MPEG-21', 'IP-based content delivery over Next Generation Networks', 'Efficient service provisioning through dynamic service task assignment in a multi-domain distributed computing environment' and 'A negotiation strategy for the Temporal Resource Reallocation Problem in multi-agent systems'.

The first paper in this special issue is the paper by Pfitzner et al. In this contribution, the authors present the results from two internet delivered experiments designed to define a heuristic that leads to a balance processing overheads of tasks, like clustering against user cognitive load in the realisation of, overall, more efficient document retrieval process. The paper falls in the topic of Internet Information and Retrieval Systems, discussing key developments in Human Computer Interaction that target to fill gaps between users' information needs and efficient search on the web. The paper also describes evaluations that the authors perform using client-side web delivery methods such as Java and JavaScript programming languages, as well as other alternatives such as browser extensions.

In the next paper, the authors (Anagnostopoulos et al.) introduce an approach for intelligent content personalisation in internet TV (IPTV) using the MPEG-21 standard in the framework. The approach aims to deliver personalised multimedia content through interactive TV (iTV) services to disabled people. It includes the development of an authoring tool for several multimedia resources (audio, video, text, images) supporting a metadata model according to MPEG-21 XML schema files. Based on that, interactivity is achieved through metadata and adaptation mechanisms.

The third paper falls into the same topic, presenting several aspects from the NGNs point of view. The authors (Gomes et al.) present an architecture for internet future environments, which bridges the gap between the content production and communication infrastructures, and is able to operate across different networks. The architecture proposed by the authors utilises the notion of service enablers deployed above evolved converged IP multimedia networks. Moreover, they describe an architecture that provides interfaces to several aspects of a telecom network, such as Multicast IP services, Network Monitoring and Management, as well as interfaces to Content Providers. The architecture is prototyped relying on standard telecommunication protocols and on Java development platforms, and seems to be a realisable approach for bringing IPTV services into NGN environments.

The fourth paper addresses the problem of distributed computing and resource allocation. As most studies in this field, the authors (Louta and Michalas) aim at efficiently utilising the otherwise unutilised powers of resources spread throughout a network to minimise the mean service/task completion time, while maximising the utilisation of resources and minimising the mean response ratio. Moreover, the authors define the mathematical formulation of the service task assignment problem, considering a multi-domain distributed computing environment. In parallel, a model for the communication cost is provided, since their approach takes into account the communication complexity introduced between the service components involved in service provisioning process. The results derived show that the overall problem can be reduced to well-known optimisation problems, which can be solved by relevant standard algorithms.

Finally, the last paper introduces a protocol negotiation strategy, which deals with the TRR-P in multi-agent systems. The authors (Alexopoulos and Wallace) first review the state of the art and then introduce a novel approach to tackle the problem addressed. Their approach employs a revised definition of promises, which in turn allows for the definition of a more complex negotiation strategy including complementary promises. Through such promises, agents are capable of reaching agreements in which more than one resource exchange takes place. The theoretical discussion leads to a theorem on the range of applicability of the proposed approach, which allows the researchers to fully specify the conditions a problem needs to adhere to in order to be solvable using the specific approach.

From our part, we thank all authors for their submitted contributions. We also acknowledge the help of all referees involved in that special issue, since their valuable comments and suggestions improved the quality of the published works.

Last but not least, we would like to express our gratitude to the journal Editors in Chief for the support provided to us and the fruitful cooperation we had.

Note

[1]http://www.ait.gr/aiai2007/