
Editorial

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Biographical notes: Christos Makris is an Assistant Professor in the Department of Computer Engineering & Informatics, University of Patras and a member of the Research Unit 5 of the Research Academic Computer Technology Institute. His research interests include data structures, web algorithmics, information retrieval and computational geometry. He has published over 50 papers in scientific journals and refereed conferences.

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1 Aims and scope

The aim of this special issue is to present research works concerning the building of hypermedia systems and infrastructures that generate and handle the level of semantics these systems need. In the past years, researchers have created a number of hypermedia environments to represent, generate and process semantics. These environments still use completely different approaches in achieving their goals, ranging from monolithic systems to sophisticated component-based approaches, from simple graph-based to elaborate multidimensional models. Although so different and manifold, they all succeed in achieving their goal: generate hypermedia semantics.

An interesting research direction is how to compare all these different approaches and see what exactly lies beneath the various implementations while finding in parallel common aspects that might be useful for future hypermedia system research. With respect to the latter, this special issue is an attempt to address the call towards a ‘synchronisation point’ within the hypermedia community. Furthermore, this special

issue aims to broaden its focus in order to include current research developments concerning the semantic hypermedia technology, especially in terms of P2P and services. The vision of semantic hypermedia, “in which information is given a well-defined meaning, better enabling computers and people to work in cooperation” (Berners-Lee *et al.*, 2001) already stresses the importance of efficient end user support for accessing and working with hypermedia information. Previous work in the field has appeared repeatedly in the *ACM Hypertext Conference* series over the years (Collier, 1987; Mehler, 1999; Marshall and Shipman, 2003; Pandis *et al.*, 2005; Millard *et al.*, 2005).

This special issue hosts six selected papers from the workshop entitled ‘International Workshop on Architectures, Models and Infrastructures to Generate Semantics in Peer-to-Peer and Hypermedia Systems’ organised in conjunction with the *17th ACM Conference on Hypertext and Hypermedia* in Odense, Denmark.

The first paper presents a semantic net-based hypermedia approach for handling the semantics and behaviour of hypermedia structures emerged in a cooperative environment. As the knowledge representation framework underlying the semantic web is also a kind of semantic net, the approach described in this work is also applicable to semantic web-based applications that need not only generic reasoning mechanisms but also application-specific computational support. The second paper proposes an architecture that enables the operation of Open Hypermedia Systems (OHS) over a P2P overlay network of OHS servers. The architecture is based on semantic annotation of (a) peer OHS servers and of (b) multimedia resources that can be obtained through the link services of the OHS. The third paper introduces an innovative service-oriented P2P system, which initialises a distributed ontology schema, semantically describing and indexing the digital content stored in distributed digital libraries. The proposed architecture enforces the distributed semantic index by defining virtual clusters consisting of nodes (peers) with similar or related content in order to provide efficient searching and recommendation mechanisms.

The last three papers deal with the indexing infrastructure needed to build such systems. The fourth paper presents an efficient XML filtering technique for matching user profiles that is based on the use of holistic twig matching algorithms and is more effective, in terms of time and space complexities, compared with previous techniques. The fifth paper presents Nested Balanced Distribution Tree (NBDT), a peer-to-peer indexing scheme. The key innovation there is that the solution is based on a totally new infrastructure, which is not vulnerable to weaknesses inherent in the previous solutions. Finally, the sixth paper examines experimentally a set of web service workflow selection algorithms using measured variation in operating system and network resource consumption.

The accepted papers are as follows:

- W. Wang, ‘Incorporating computational semantics into emergent hypermedia structures’.
- T. Tiropanis and D. Kanellopoulos, ‘A schema-based P2P network to enable publish-subscribe for multimedia content in open hypermedia systems’.
- C. Alexakos, K. Paraskevopoulos, K. Votis and S. Likothanassis, ‘Ontology-supported indexing in P2P networks of digital libraries’.
- P. Antonellis and C. Makris, ‘XFIS: an XML filtering system based on string representation and matching’.

- S. Sioutas, 'NBDT: an efficient P2P indexing scheme for web service discovery'.
- E. Sakkopoulos, Y. Panagis, K. Papakonstantinou and A. Tsakalidis, 'Web service workflow selection using system and network QoS constraints'.

References

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