SITIS Special Issue

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Introduction

The international conference on Signal Image Technology & Internet-based Systems (SITIS) is a joint event consisting of conference tracks on the themes of Signal and Image processing and the emerging Internet based computing and Systems. It provides an avenue for discussion and exchange of new ideas addressing several areas. SITIS brings together researchers, academic and professional leaders, consultants, and practitioners, all over the world to discuss and to share experiences with researchers from economically developing countries. More details can be found at http://www.u-bourgogne.fr/SITIS/ . In 2005, 130 papers were submitted from which only 45 papers were accepted for inclusion in the conference Proceedings.

In this special issue, we present an interesting variety of recent research papers on various aspects of Internet-Based Computing and Systems. We include in this special issue extended versions of the 6 best scored papers accepted in Internet-Based Computing and Systems track. The structure of this issue is divided into several topics:

- Distributed Information Systems
- Information Retrieval
- XML Applications
- Multimedia Data Management
- Mobile Agents

Structure of the special issue

The first paper addresses the pervasive computing environments where capturing the user's expression of an action intention, solving ambiguousness in this expression, and executing the final pervasive action are required. In "*Expressing and Interpreting User Intention in Pervasive Service Environments*", the authors introduce the Pervasive Service Action Query Language (PsaQL), a language to formalize the description of a user intention using composed pervasive services. A mathematical model is given, which helps to express the algorithms performing translation of the user intention into an executable action. To implement such algorithms, a suitable object-oriented model representing actions is introduced. In the scope of PERSE, a pervasive service environment developed by the authors, general evaluation metrics for such algorithms are identified, a prototype has been developed and first benchmark results are presented.

In the second paper titled "*Using BFA with WordNet Based Model for Web Retrieval*", the authors study the problem of document indexing. The need to find a few words or concepts, which characterize the document based on its contents, to overcome the problem of the "curse of dimensionality", makes indexing of high-dimensional data problematic. To do so, the authors earlier proposed a Wordnet and Wordnet+LSI (Latent Semantic Indexing) based model for dimension reduction. While LSI works on the whole collection, another procedure of feature extraction (and thus dimension reduction) exists, using binary factorization. The procedure is based on the search of attractors in Hopfield-like associative memory. Being applied to textual data the procedure conducted well and even more it showed sensitivity to the context in which the words were used. In this paper, the authors suggest that the binary factorization may benefit from the Wordnet filtration.

The third and fourth papers are devoted to XML applications. The aim of the paper "*A New Persistent Labeling Scheme for XML*" is to design a persistent structural labeling scheme, namely a labeling scheme where labels encode ancestor-descendant relationships and sibling relationship between nodes. This is very useful when XML data need to be updated frequently because most of current approaches need to re-compute existing labels which is rather time consuming. In "*Extracting Information From Coarser-grained Data in XML Documents*", the author deals with extraction of relevant data in semi-structured documents and presents a specification language to write expressive and easy extraction patterns. The specification relies on regular expression fashion in order to write patterns by non expert users. In addition, the author introduces the Xtractor wrapper for coarser-grained data (i.e. paragraphs). The Xtractor hinges on linguistic parsing of paragraphs and applies technical and natural language dictionaries. Then it employs the extraction patterns against the pre-processed paragraphs in order to locate relevant data. The key idea of this approach consists of translating the extraction patterns to Finite State Transducers (FST) and even using the FST to build the domain specific dictionaries.

The fifth paper "*Providing Support for Interaction with Consistent Multimedia Presentations*" emphasizes the problem of multimedia presentations generally specified in terms of spatial and temporal relations between the media objects involved. Creation of these presentations, and interactions with them during their play-out, require an effective mechanism for handling the specifications dynamically. These specifications could result in inconsistencies, which need to be checked and resolved. Moreover, consistent presentations could become inconsistent due to interactions during the playout. The main contribution of this paper is the design of an algorithm which aids in resolving these consistency issues dynamically and

efficiently. The other salient features of our approach are a new composite spatio-temporal operator and an effective relaxation policy. A prototype has been implemented to study the effectiveness of the proposed approach. Thus, this paper presents an interactive multimedia presentation mechanism, which maintains a consistent and complete set of constraints during authoring and play-out of the presentation.

In the last paper titled "*Ad Hoc Location Service for Mobile Agents*", the authors study two implementations of a mobile agent location service in the context of an underlying ad hoc network. More precisely, this service aims at solving the problem of routing an agent toward a target agent in order to cooperate on a common host. Both the migration number and the tracking time must be minimized by such a service. The authors compare two implementations based on rumor propagation using either a piggybacking approach or a gossipy agent-based approach. The comparison of the two solutions is based upon simulation results. Performance analysis demonstrates that the piggybacking approach minimizes the response time and the gossipy agent-based approach minimizes the network overhead.

Conclusion

We hope this special issue motivates researchers to take the next step beyond building models to implementing, evaluating, comparing, and extend proposed approaches.

Many people worked long and hard to help this issue become a reality. We would first like to gratefully acknowledge and sincerely thank all the reviewers for their timely and insightful valuable comments and criticism of the manuscripts that greatly improved the quality of the final versions. Of course, thanks are due to the authors, who provided excellent articles and timely extended revisions. Finally, we are grateful to the editors of JDIM, in particular P. Pichappan, for his trust in SITIS, his efforts, patience, and painstaking editorial work during the production of this special issue.