Preface

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Biographical notes: Richard Chbeir received his PhD in Computer Science from the University of INSA-FRANCE in 2000. He became a member of IEEE since 1999. He is currently an Associate Professor in the Computer Science Department of the Bourgogne University, Dijon-France. His research interests are in the areas of distributed multimedia database management, XML similarity and rewriting, spatio-temporal applications, indexing methods, multimedia access control models, security and watermarking. He has published (more than 40 peer-reviewed publications) in international journals, books and conferences, and has served on the programme committees of several international conferences. He has been organising many international conferences and workshops. He is currently the Chair of the French Chapter ACM SIGAPP and the Vice-Chair of ACM SIGAPP.

Agma J.M. Traina received the BSc, the MSc and PhD in Computer Science from the University of São Paulo, Brazil, in 1983, 1987 and 1991, respectively. She is currently a Full Professor with the Computer Science Department at the University of São Paulo at São Carlos, Brazil. Her research interests include image databases, Content-Based Image Retrieval (CBIR), Picture Archive and Communication Systems (PACS), image mining, indexing methods for multidimensional data, information visualisation and image processing for medical applications. She has supervised 26 graduate students in these fields.

Catherine Berrut is Professor in the Polytech' Engineering School of University Joseph Fourier, Grenoble France. Presently, she is Vice-President of the University Joseph Fourier – Grenoble. Since January 2003, she is heading the Information Retrieval Group MRIM at Grenoble. She has been involved in a number of EEC-funded international collaborations among which the MIRO and MIRA working groups dedicated to multimedia information retrieval, FERMI, a basic research action dedicated to the study and the experimentation of logic-based IR models, TIPS, a European project dedicated to collaborative filtering. She is also involved in several national research projects: Annapurna funded by the French Ministry of Industry, RTP Bases de Donnes et d'Information funded by the CNRS. She founded a French working group on Indexing and Information Retrieval, funded by the CNRS. She was the co-organiser of the European Summer School in Information Retrieval (ESSIR) in 2003. She is also the President of the French Association of Information Retrieval Researchers.

1 Introduction

During the past decade, the information society entered a new era and information became locatable everywhere. An explosion in the amount of multimedia and XML streams being captured from sensor devices and networks, embedded processors, online transaction flows in retail chains, web record and click streams in web applications, performance measurement in network monitoring, call records in telecommunications, etc., has been witnessed to monitor traffic, weather, goods, factories, ports, health, finances, sales, etc. This has conducted to the emergence of a new generation of ambient and context-aware applications. As the amount of these streams grows and cannot be predicted (due to their continuous nature), mining and querying such a large data set is an interesting way of discovering information and new knowledge, and is challenging since it bridges together several disciplines such as database systems, XML and information retrieval, artificial intelligence and multimedia processing. Thus, it becomes important to understand what multimedia and XML streams mining and querying techniques are, how data-mining techniques can contribute to discover new knowledge in those streams, and how to organise and manage the discovered knowledge and concepts.

This special issue aims to assess the current status and technologies, as well as to outline the major challenges and future perspectives, related to the mining and querying of multimedia and XML streams. It includes three papers that have been selected after a very tight peer review in which each paper has been reviewed by three reviewers.

In the first paper of this special issue titled 'Using textual and structural context for searching Multimedia Elements', Mouna Torjmen, Karen Pinel-Sauvagnat and Mohand Boughanem investigate the use of XML structure in multimedia retrieval, particularly in context-based image retrieval. They propose two methods to represent multimedia objects: the first one is based on an implicit use of textual and structural context of multimedia objects, whereas the second one is based on an explicit use of both sources. The first method (also called CBA) evaluates the relevance of multimedia objects through their children, brothers and ancestors elements, which are weighted with a traditional XML retrieval system. The benefit of this method (CBA) is that it allows the estimation of how many sources of evidence (children, brothers or ancestors nodes) are

necessary to represent multimedia objects. The second method (called OntologyLike) is based on an analogy between the XML document tree and an ontology. With this analogy, they define a measure to evaluate the participation degree of each textual node in the multimedia object representation. The provided measure is inspired from similarity measures applied on ontologies, and more precisely on those based on edge-counting between two concepts. The OntologyLike method allows the evaluation of different structural factors that are able to improve multimedia objects representation and consequently multimedia retrieval. Experimental evaluation of both methods is carried out using the INEX MultimediaFragments Task 2006 and 2007. The authors show thanks to the CBA method that there is a strong vocabulary relation between the query and the multimedia object representation, and thanks to the OntologyLike method that using XML structure improves significantly the effectiveness of multimedia retrieval.

The second paper is titled 'Local-feature-based image retrieval with weighted relevance feedback'. Here, Rudra Narayan Hota, Shahanaz Syed and Pisipati Radha Krishna address the problem of accurate and fast retrieval of relevant images, since it is a challenging task mainly due to the limitation in understanding hidden knowledge in images, known as semantic gap. In this work, the authors propose a novel approach, which incorporates local feature representation for retrieval of grey and colour images from an archive with user intervention. They use histogram features, which are computationally efficient, hence resulting in quick image retrieval. This approach presents a workflow with users weighted feedback and local feature representation for image retrieval. The computed image feature vectors are used for similarity matching with weighted feedbacked image retrieval. The authors experiment both on publicly available colour images and on annotated medical image data sets to illustrate the effectiveness of their approach. They also compare retrieval performance with various local and global, grey and colour histogram and texture (from Gabor filters and Haralick co-occurrence matrix) feature extraction techniques, and the presented relevance feedback scheme outperforms other methods.

The aim of the third paper 'A visual framework to understand similarity queries and explore data in Metric Access Methods', authored by Marcos R. Vieira, Fabio J.T. Chino, Caetano Traina Jr. and Agma J.M. Traina, is to explore visualisation techniques. In essence, visualisation techniques have been employed to enhance the cognitive ability of human beings to quickly understand patterns and properties occurring in data stored in databases. To tune index structures, find suitable structures and analyse data commonly stored in relational database systems, some properties of the data set indexed are extracted, aggregated and presented to the users. Nowadays, new kinds of data, such as images, DNA sequences and fingerprints, have been stored and managed by special access methods. The majority of these methods are in metric spaces, where assessing similarity is the only way to compare pairs of elements. The lack of properties relating the results of the similarity comparisons makes the comprehension of the organisation of the stored data in such structures a hard task. Knowing the organisation of data is important to detect bottlenecks and tune index structures, among other things. This paper presents the MAMView framework to help users and developers of Metric Access Methods (MAMs) in understanding the data organisation in those structures. Users and developers can explore and share dynamic and interactively 2- or 3-dimensional representations of a MAM. Such representations can be the steps of a similarity query or insertion of an object, or the data organisation in a MAM. The MAMView framework was developed as a practical tool that has been successfully applied in studying the

existing MAM, helping novice users better understand the behaviour and properties of such structures, as well developers to verify and drill-down their new proposed structures. The MAMView ability to seamlessly extract and produce graphical representations in XML format makes the representations easy to analyse and share among users.

2   Conclusion

We hope this special issue motivates researchers to take the next step beyond building models to implement, evaluate, compare and extend proposed approaches.

Many people worked long and hard to help this edition become a reality. We gratefully acknowledge and sincerely thank all the editorial board members and reviewers for their timely and insightful valuable comments and evaluations of the manuscripts that greatly improved the quality of the final versions. Of course, we offer thanks to all the authors for their contribution and cooperation. Finally, we express our thanks to Professor David Taniar for his support and trust in us.