

Springer

Berlin

Heidelberg

New York

Barcelona

Budapest

Hong Kong

London

Milan

Paris

Singapore

Tokyo

Sushil Jajodia M. Tamer Özsu
Asuman Dogac (Eds.)

Advances in Multimedia Information Systems

4th International Workshop, MIS'98
Istanbul, Turkey September 24-26, 1998
Proceedings



Springer

Series Editors

Gerhard Goos, Karlsruhe University, Germany
Juris Hartmanis, Cornell University, NY, USA
Jan van Leeuwen, Utrecht University, The Netherlands

Volume Editors

Sushil Jajodia
George Mason University
School of Computer Science and Information Systems
Fairfax, VA 22030-4444, USA
E-mail: jajodia@gmu.edu

M. Tamer Özsu
University of Alberta, Department of Computing Science
Edmonton, Alberta, Canada T6G 2H1
E-mail: ozsu@cs.ualberta.ca

Asuman Dogac
Middle East Technical University
Department of Computer Engineering
Ankara, Turkey
E-mail: asuman@srdc.metu.edu.tr

Cataloging-in-Publication data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Advances in multimedia information systems : 4th international workshop ; proceedings / MIS'98, Istanbul, Turkey, September 24 - 26, 1998. Sushil Jajodia (ed.). - Berlin ; Heidelberg ; New York ; Barcelona ; Budapest ; Hong Kong ; London ; Milan ; Paris ; Singapore ; Tokyo : Springer, 1998
(Lecture notes in computer science ; Vol. 1508)
ISBN 3-540-65107-1

CR Subject Classification (1991): H.5.1, H.4, H.5, I.7, C.2, I.4

ISSN 0302-9743

ISBN 3-540-65107-1 Springer-Verlag Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer-Verlag. Violations are liable for prosecution under the German Copyright Law.

© Springer-Verlag Berlin Heidelberg 1998
Printed in Germany

Typesetting: Camera-ready by author
SPIN 10692647 06/3142 - 5 4 3 2 1 0 Printed on acid-free paper

Preface

This book constitutes the proceedings of the Fourth International Workshop on Multimedia Information Systems (MIS'98) held in Istanbul, Turkey in September 1998. This workshop builds upon the success of the three previous workshops in this series that were held in Arlington, VA, West Point, NY, and Como, Italy. As in the past, this is a small focused workshop, consisting of participants drawn from a wide variety of disciplines (e.g. theory, algorithms, real-time systems, networks, operating systems, graphics and visualization, databases, artificial intelligence, etc.), all of which focus on research on one or more aspects of multimedia systems.

The workshop program included 19 technical papers, three invited talks, and one panel. Of the technical papers 13 were accepted as regular papers and 6 as short contributions. These papers cover a number of areas including:

- Multimedia storage system design
- Image storage and retrieval systems
- Quality of service considerations
- Networking support for multimedia information systems
- Distributed virtual environments
- Multimedia system architecture issues

The invited talks were given by three experts well-known for their work in this area. Satish K. Tripathi's (University of California, Riverside) talk was on "Quality of Service Support for Multimedia Data on Internet", Paul Emmerman (US Army Research Laboratory) discussed "Visualizing the Digital Battlefield", and Val Tannen (University of Pennsylvania) presented "Heterogeneous Data Integration with Mobile Information Manager". The panel discussion, organized by Chahab Nastar of INRIA, France, addressed "Trends in Visual Information Retrieval."

We believe the workshop program to have been very interesting and to have addressed timely issues. We hope that the attendees enjoyed the presentations and the ensuing discussions. Given the location of the workshop, we hope they will have taken advantage of the social life that Istanbul has to offer. Readers of these proceedings may miss out on the social side of the workshop, but we hope they will at least benefit from the offerings of the technical program.

We wish to express our appreciation to all the authors of the submitted papers, to the program committee members, and to our invited speakers and the panel participants.

July 1998

Sushil Jajodia
M. Tamer Özsu
Asuman Dogac

Acknowledgements

We would like to express our gratitude to the U.S. Army Research Office, which has generously supported this series of workshops since its inception.

We are indebted to the program committee members for their assistance in evaluating the submitted papers. The committee consists of:

Karl Aberer (GMD-IPSI, Germany)
 Michel Adiba (University of Grenoble, France)
 Peter Buneman (University of Pennsylvania, USA)
 K. Selcuk Candan (Arizona State University, USA)
 Tiziana Catarci (University of Rome "La Sapienza", Italy)
 Stavros Christodoulakis (Technical University of Crete, Greece)
 Nicolas D.Georganas (University of Ottawa, Canada)
 Leana Golubchik (University of Maryland, USA)
 Dave Hislop (US Army Research Office, USA)
 Veysi Isler (Middle East Technical University, Turkey)
 Xiaobo Li (University of Alberta, Canada)
 Richard Muntz (UCLA, USA)
 Chahab Nastar (INRIA-Rocquencourt, France)
 Shamkant Navathe (Georgia Institute of Technology, USA)
 Banu Ozden (Bell Labs, USA)
 Meral Ozsoyoglu (Case Western Reserve University, USA)
 George A. Papadopoulos (University of Cyprus, Cyprus)
 Thomas Rakow (Springer-Verlag, Germany)
 V.S. Subrahmanian (University of Maryland, USA)
 Satish K. Tripathi (University of California, Riverside, USA)
 Philip S. Yu (IBM T.J. Watson Research Center, USA)

Finally, we would like to express our gratitude to the University of Maryland Institute for Advanced Computer Studies; the Center for Secure Information Systems, George Mason University; the Research Institute for Multimedia Systems of the University of Alberta; the Middle East Technical University, Ankara, Turkey; and Bosphorus University, Istanbul, Turkey. In particular, we would like to thank the members of the Software Research and Development Center of the Middle East Technical University for their assistance with many organizational issues.

Table of Contents

Quality of Service Support for Multimedia Data on Internet (Invited talk)	1
<i>S.K. Tripathi</i>	
Visualizing the Digital Battlefield (Invited talk)	2
<i>P. Emmerman</i>	
Heterogeneous Data Integration with Mobile Information Manager (Invited talk)	4
<i>V. Tannen</i>	
A Scalable Video-on-Demand Server for a Dynamic Heterogeneous Environment	5
<i>M. Papadopouli, L. Golubchik</i>	
Dynamic Skyscraper Broadcasts for Video-on-Demand	19
<i>D.L. Eager, M.K. Vernon</i>	
Deciding Round Length and Striping Unit Size for Multimedia Servers	33
<i>K.O.Lee, H.Y. Yeom</i>	
Management and Rendering of Multimedia Views	45
<i>K.S. Candan, E. Lemar, and V.S. Subrahmanian</i>	
NETCICATS: Network-Conscious Image Compression and Transmission System	57
<i>S. Iren, P.D. Amer, and P.T. Conrad</i>	
ABR Service in ATM Networks: Performance Comparison between BECN and Adaptive Stochastic Congestion Control Schemes with Guaranteed Minimum Cell Rate	69
<i>S.S. Petrovic</i>	
An Admission Control Framework for Applications with Variable Consumption Rates in Client-Pull Architectures	82
<i>S. Hollfelder, K. Aberer</i>	
Accurate Modelling of VBR Coded Video Sources in ATM Networks	98
<i>G. Sisodia, M. Hedley, S. De, and L. Guan</i>	
Retrieving Images by Content: The Surfimage System	110
<i>C. Natar, M. Mitschke, N. Boujemaa, C. Meilhac, H. Bernard, and M. Mantref</i>	
Weakly Constraining Multimedia Types based on a Type Embedding Ordering	121
<i>C. Altenschmidt, J. Biskup, J. Freitag, and B. Sprick</i>	

Balancing Workload and Communication Cost for a Distributed Virtual Environment	130
<i>J.C.S. Lui, M.F. Chan, O.K.Y. So, and T.S. Tam</i>	
Networked Visualization of Heterogeneous US Army War Reserve Readiness Data... ..	136
<i>J.H. Schafer, T.J. Rogers, and J.A. Marin</i>	
A Museum-Oriented Authoring Tool	148
<i>A. Grimaldi, T. Catarci</i>	
Modeling and Retrieving Audiovisual Information – A Soccer Video Retrieval System	161
<i>A. Woudstra, D.D. Velthausz, H.J.G. de Poot, F.M. El-Hadidy, W. Jonker, M.A.W. Houtsma, R.G. Heller, and J.N.H. Heemskerk</i>	
A Flexible Architecture for the Integration of Media Servers and Databases.....	174
<i>H. Süß</i>	
Sketch-Based Images Database Retrieval.....	185
<i>S. Matusiak, M. Daoudi, T. Blu, and O. Avaro</i>	
An Integrated Data Model and A Query Language for Content-Based Retrieval of Video.....	192
<i>Y.I. Choi, Y.M. Park, H.S. Lee, and S.I. Jin</i>	
Virtual Reality for Image Retrieval	199
<i>J. Assfalg, A. Del Bimbo, and P. Pala</i>	
Trends in Visual Information Retrieval (Panel Description).....	205
<i>C. Nastar</i>	
Author Index	207