Lecture Notes in Computer Science 4156

Commenced Publication in 1973
Founding and Former Series Editors:
Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison
Lancaster University, UK

Takeo Kanade
Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler
University of Surrey, Guildford, UK

Jon M. Kleinberg
Cornell University, Ithaca, NY, USA

Friedemann Mattern
ETH Zurich, Switzerland

John C. Mitchell
Stanford University, CA, USA

Moni Naor
Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz
University of Bern, Switzerland

C. Pandu Rangan
Indian Institute of Technology, Madras, India

Bernhard Steffen
University of Dortmund, Germany

Madhu Sudan
Massachusetts Institute of Technology, MA, USA

Demetri Terzopoulos
University of California, Los Angeles, CA, USA

Doug Tygar
University of California, Berkeley, CA, USA

Moshe Y. Vardi
Rice University, Houston, TX, USA

Gerhard Weikum
Max-Planck Institute of Computer Science, Saarbruecken, Germany

Sihem Amer-Yahia Zohra Bellahsène
Ela Hunt Rainer Unland
Jeffrey Xu Yu (Eds.)

Database and XML Technologies

4th International XML Database Symposium, XSym 2006
Seoul, Korea, September 10-11, 2006
Proceedings

Springer

Volume Editors

Sihem Amer-Yahia
Yahoo! Research
New York, NY, 10011, USA
E-mail: sihem@yahoo-inc.com

Zohra Bellahsène
LIRMM UMR 5506 CNRS/Université Montpellier II
34392 Montpellier, France
E-mail: bella@lirmm.fr

Ela Hunt
Global Information Systems Group,
Institut für Informationssysteme, ETH-Zentrum
8092 Züich, Switzerland
E-mail: elahunt@inf.ethz.ch

Rainer Unland
University of Duisburg-Essen
Institute for Computer Science and Business Information Systems (ICB)
45117 Essen, Germany
E-mail: UnlandR@informatik.uni-essen.de

Jeffrey Xu Yu
The Chinese University of Hong Kong
Department of Systems Engineering and Engineering Management
Shatin, New Territories, Hong Kong, China
E-mail: yu@se.cuhk.edu.hk

Library of Congress Control Number: 2006931570

CR Subject Classification (1998): H.2, H.3, H.4, D.2, C.2.4

LNCS Sublibrary: SL 3 – Information Systems and Application, incl. Internet/Web and HCI

ISSN 0302-9743
ISBN-10 3-540-38877-X Springer Berlin Heidelberg New York
ISBN-13 978-3-540-38877-7 Springer 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. Violations are liable to prosecution under the German Copyright Law.

Springer is a part of Springer Science+Business Media

springer.com

© Springer-Verlag Berlin Heidelberg 2006
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 11841920 06/3142 5 4 3 2 1 0

Preface

The theme of the XML Database Symposium (XSym) is the convergence of database technology with XML technology. Since the first International XML Symposium in 2003, XSym has continued to provide a forum for academics, practitioners, users and vendors to discuss the use of and synergy between advanced XML technologies.

XSym 2006 received 32 full paper submissions. Each submitted paper underwent a rigorous review by independent referees. These proceedings represent a collection of eight excellent research papers. Their focus is on building XML repositories and covers the following topics: XML query processing, caching, indexing and navigation support, structural matching, temporal XML, and XML updates.

The organizers would like to express their gratitude to the XSym program committee for their efforts in providing very thorough evaluations of the submitted papers under significant time constraints. We also would like to thank Microsoft for their sponsorship and for the use of the Microsoft Conference Management Toolkit, and the local organizers, especially, Kyuseok Shim, for all they did to make XSym a pleasant and successful event.

July 2006

Sihem Amer-Yahia
Zohra Bellahsene
Jeffrey Xu Yu
Ela Hunt
Rainer Unland

Organization

General Chair

Zohra Bellahsene, LIRMM (France)

Local Chair

Kyuseok Shim, Seoul National University (Korea)

Program Committee Chairs

Sihem Amer-Yahia, Yahoo (USA)
Jeffrey Xu Yu, Chinese University of Hong Kong (China)

Proceedings

Rainer Unland, University of Duisburg-Essen (Germany)

Communications and Sponsorship

Ela Hunt, ETH Zurich (Switzerland)

Members of the International Program Committee

Ashraf Aboulnaga, University of Waterloo (Canada)
Bernd Amann, Université Paris 6 (France)
Denilson Barbosa, University of Calgary (Canada)
Omar Benjelloun, Stanford University (USA)
Veronique Benzaken, Université Paris-Sud (France)
Philip Bernstein, Microsoft Research (USA)
Philip Bohannon, Bell Laboratories - Lucent Technologies (USA)
Jihad Boulos, American University of Beirut (Lebanon)
Stephane Bressan, National University of Singapore (Singapore)
Yi Chen, Arizona State University (USA)
Alex Dekhtayar, University of Kentucky (USA)
Alin Deutsch, University of California at San Diego (USA)
Yanlei Diao, University of Massachusetts at Amherst (USA)
Irini Fundulaki, University of Edinburgh (UK)
Minos Garofalakis, Intel Research (USA)

.

Giorgio Ghelli, Università di Pisa (Italy)
Torsten Grust, Technical University of Munich (Germany)
Giovanna Guerrini, Università di Genova (Italy)
Ela Hunt, ETH Zurich (Switzerland)
Ihab Ilyas, University of Waterloo (Canada)
Zack Ives, University of Pennsylvania (USA)
Vanja Josifovski, Yahoo Research (USA)
Carl Christian Kanne, University of Mannheim (Germany)
Yaron Kanza, University of Toronto (Canada)
Raghav Kaushik, Microsoft Research (USA)
Laks Lakshmanan, University of British Columbia (Canada)
Dongwon Lee, Pennsylvania State University (USA)
Mong Li Lee, National University of Singapore (Singapore)
Qiong Luo, Hong Kong University of Science and Technology (China)
Murali Mani, Worcester Polytechnic Institute (USA)
Amelie Marian, Rutgers University (USA)
Peter McBrien, Imperial College - London (UK)
Tova Milo, Tel Aviv University (Israel)
Atsuyuki Morishima, University of Tsukuba (Japan)
Fatma Ozcan, IBM Almaden Research Center (USA)
Tamer Ozsu, University of Waterloo (Canada)
Tadeusz Pankowski, Poznan University of Technology (Poland)
Alkis Polyzotis, University of California at Santa Cruz (USA)
Philippe Pucheral, INRIA (France)
Prakash Ramanan, Wichita State University (USA)
Michael Rys, Microsoft (USA)
Monica Scannapieco, Università di Roma "La Sapienza" (Italy)
Jayavel Shanmugasundaram, Cornell University (USA)
Jerome Simeon, IBM Research (USA)
Divesh Srivastava, AT&T Research (USA)
Martin Theobald, Max-Planck-Institut fűr Informatik (Germany)
Vasilis Vassalos, Athens University of Economics and Business (Greece)
Stratis Viglas, University of Edinburgh (UK)
Yuqing Melanie Wu, Indiana University (USA)
Jun Yang, Duke University (USA)

Table of Contents

Query Evaluation and Temporal XML

Kappa-Join: Efficient Execution of Existential Quantification in XML Query Languages 1
Matthias Brantner, Sven Helmer, Carl-Christian Kanne, Guido Moerkotte

Index vs. Navigation in XPath Evaluation 16
Norman May, Matthias Brantner, Alexander Böhm, Carl-Christian Kanne, Guido Moerkotte

Consistency of Temporal XML Documents 31
Marcela Campo, Alejandro Vaisman

XPath and Twigs

A Logic-Based Approach to Cache Answerability for XPath Queries 46
Massimo Franceschet, Enrico Zimuel

FLUX: Content and Structure Matching of XPath Queries with Range Predicates 61
Hua-Gang Li, S. Alireza Aghili, Divyakant Agrawal, Amr El Abbadi

A Resource Efficient Hybrid Data Structure for Twig Queries 77
John Wilson, Richard Gourlay, Robert Japp, Mathias Neumüller

XML Updates

On the Expressive Power of XQuery-Based Update Languages 92
Jan Hidders, Jan Paredaens, Roel Vercammen

Efficient Incremental Validation of XML Documents After Composite Updates 107
Denilson Barbosa, Gregory Leighton, Andrew Smith

Author Index 123