# Lecture Notes in Computer Science

3433

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

New York University, NY, 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

Subhash Bhalla (Ed.)

# Databases in Networked Information Systems

4th International Workshop, DNIS 2005 Aizu-Wakamatsu, Japan, March 28-30, 2005 Proceedings



#### Volume Editor

Subhash Bhalla University of Aizu

Department of Computer Software, Database Systems Laboratory Tsuruga, Ikki Machi, Aizu-Wakamatsu City, Fukushima, 965-8580, Japan

E-mail: bhalla@u-aizu.ac.jp

Library of Congress Control Number: Applied for

CR Subject Classification (1998): H.2, H.3, H.4, H.5, C.2

ISSN 0302-9743

ISBN 3-540-25361-0 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

springeronline.com

© Springer-Verlag Berlin Heidelberg 2005 Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India Printed on acid-free paper SPIN: 11401339 06/3142 5 4 3 2 1 0

### **Preface**

Information systems in healthcare and public utility services depend on computing infrastructures. Many research efforts are being made in related areas, such as wireless computing (e.g., Auto-ID Laboratories, and projects at MIT), Webbased computing, and information accesses by Web users. Government agencies in many countries plan to launch facilities in education, healthcare and information support as a part of e-government initiatives. In this context, information interchange management has become an active research field. A number of new opportunities have evolved in design and modeling based on new computing needs of users. Database systems play a central role in supporting networked information systems for access and storage management aspects.

The 4th International Workshop on Databases in Networked Information Systems (DNIS 2005) was held on March 28–30, 2005 at the University of Aizu in Japan. The workshop program included research contributions, and invited contributions. A view of research activity in Information Interchange Management and related research issues was provided by the session on this topic. The invited contribution was contributed by Dr. Umeshwar Dayal. The workshop session on Web Data Management Systems had invited papers by Prof. Elisa Bertino, Prof. Masahito Hirakawa, and Prof. William I. Grosky. The two sessions on Networked Information Systems included invited contributions by Prof. Sushil Jajodia, Dr. Cyrus Shahabi, Prof. Divyakant Agrawal and Dr. Harumi Kuno. I would like to thank the members of the Program Committee for their support and all authors who considered DNIS 2005 in making research contributions.

The sponsoring organizations and the Organizing Committee deserve praise for the support they provided. A number of individuals contributed to the success of the workshop. I thank Dr. Umeshwar Dayal, Prof. J. Biskup, Prof. D. Agrawal, Prof. Elisa Bertino, Dr. Cyrus Shahabi, Prof. Sushil Jajodia and Dr. Mark Sifer for providing continuous support and encouragement.

The workshop received invaluable support from the University of Aizu. In this context, I thank Prof. Ikegami, President of the University of Aizu. I thank Prof. Daming Wei, Head of the Department of Computer Software, for making the support available. I express my gratitude to the members and chairman of the International Affairs Committee, for supporting the workshop proposal. Many thanks are also due to the faculty members at the university for their cooperation and support.

March 2005 Subhash Bhalla

## Organization

The DNIS 2005 international workshop was organized by the Database Systems Laboratory, University of Aizu, Aizu-Wakamatsu City, Fukushima, 965-8580, Japan.

#### **Executive Committee**

Honorary Chair
Program Chair
S. Bhalla, University of Aizu, Japan
Organizing Chair
Hui Wang, University of Aizu, Japan
Executive Chair
N. Bianchi-Berthouze, University of
Aizu, Japan

#### Program Committee

- D. Agrawal, University of California, USA
- F. Andres, National Center for Science Information Systems, Japan
- N. Berthouze, University of Aizu, Japan
- E. Bertino, Purdue University, USA
- S. Bhalla, University of Aizu, Japan
- P.C.P. Bhatt, Indian Institute of Information Technology, Bangalore, India
- J. Biskup, University of Dortmund, Germany
- L. Capretz, University of Western Ontario, Canada
- M. Capretz, University of Western Ontario, Canada
- U. Dayal, Hewlett-Packard Laboratories, USA
- W.I. Grosky, University of Michigan-Dearborn, USA
- J. Herder, University of Applied Sciences, Fachhochschule Dusseldorf, Germany
- M. Hirakawa, Shimane University, Japan
- Q. Jin, University of Aizu, Japan
- A. Kumar, Pennsylvania State University, USA
- H. Kuno, Hewlett-Packard Laboratories, USA
- J. Li, University of Tsukuba, Japan
- K. Myszkowski, Max-Planck-Institut fuer Informatik, Germany
- T. Nishida, Kyoto University, Japan
- A. Pasko, Hosei University, Tokyo, Japan
- L. Pichl, University of Aizu, Japan
- V. Savchenko, Hosei University, Japan
- C. Shahabi, University of Southern California, USA
- M. Sifer, Sydney University, Australia
- H. Wang, University of Aizu, Japan

## **Sponsoring Institution**

International Affairs Committee, University of Aizu, Aizu-Wakamatsu City, Fukushima, 965-8580, Japan

# **Table of Contents**

Information Interchange and Management Systems	
Predictive Business Operations Management  Malu Castellanos, Norman Salazar, Fabio Casati, Umesh Dayal,  Ming-Chien Shan	1
Conversation Quantization for Conversational Knowledge Process  Toyoaki Nishida	15
Wrapper Generation for Automatic Data Extraction from Large Web Sites  Nitin Jindal	34
Efficiently Coding and Querying XML Document  Zhongming Han, Niya Fu	54
An Interface for Web Based Access to Dynamic Contents Subhash Bhalla, Masaki Hasegawa, Enrique Lopez de Lara Gutierrez, Nadia Berthouze, Tomoko Izumita	70
HID: An Efficient Path Index for Complex XML Collections with Arbitrary Links  Awny Sayed, Rainer Unland	78
Web Data Management Systems	
Integration of Virtual Reality and Database System Techniques Elisa Bertino, Stefano Franzoni, Pietro Mazzoleni, Stefano Valtolina	92
From MultiMedia to UniversalMedia  Masahito Hirakawa	104
The Multimedia Semantic Web  William I. Grosky	115
Storing and Retrieving Multimedia Web Notes  Paolo Bottoni, Roberta Civica, Stefano Levialdi, Laura Orso,  Emanuele Panizzi, Rosa Trinchese	110

A Searching Method Based on Problem Description and Algorithmic Features	
Yutaka Watanobe, Rentaro Yoshioka, Nikolay N. Mirenkov	138
Augmenting the Power of the Various Versions of LSI Used in Document Retrieval  Hua Yan, William I. Grosky, Farshad Fotouhi	150
Networked Information Systems: Applications	
Networked Mining of Atomic and Molecular Data from Electronic Journal Databases on the Internet Lukáš Pichl, Manabu Suzuki, Kazuyuki Joe, Akira Sasaki	159
Development of a Data Mining Application for Huge Scale Earth Environmental Data Archives  Eiji Ikoma, Kenji Taniguchi, Toshio Koike,  Masaru Kitsuregawa	171
Design of Automation Systems for Web Based Courseware Using XML and XSLT  Yukari Shirota	186
Towards Open Education Through Distributed and Networked Information Systems - An Experience-Based Approach  Tosiyasu L. Kunii	204
Exploring Web Logs with Coordinated OLAP Dimension Hierarchies  Mark Sifer	213
Networked Information Systems: Implementations	
Policies, Models and Languages for Access Control  Sabrina De Capitani di Vimercati, Pierangela Samarati,  Sushil Jajodia	225
Modelling Peer-to-Peer Data Networks Under Complex System Theory  Cyrus Shahabi, Farnoush Banaei-Kashani	238
Attribute-Based Access to Distributed Data over P2P Networks  Divyakant Agrawal, Amr El Abbadi, Subhash Suri	244

Governing the Contract Lifecycle: A Framework for Sequential Configuration of Loosely-Coupled Systems Harumi Kuno, Kei Yuasa, Kannan Govindarajan, Kevin Smathers,	
Bernard Burg, Paul Carau, Kevin Wilkinson	264
GridFS: Ensuring High-Speed Data Transfer Using Massively Parallel I/O  Dheeraj Bhardwaj, Manish Sinha	280
Data Management Systems	200
Data Management Systems	
Improving Customer Experience via Text Mining Choudur Lakshminarayan, Qingfeng Yu, Alan Benson	288
A Distributed Algorithm for Outlier Detection in a Large Database  Biplab Kumer Sarker, Hiroyuki Kitagawa	300
An Improved Approach to Extract Document Summaries Based on Popularity	
P. Arun Kumar, K. Praveen Kumar, T. Someswara Rao, P. Krishna Reddy	310
Author Index	319