Lecture Notes in Computer Science

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 Alfred Kobsa University of California, Irvine, CA, 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 TU Dortmund University, Germany Madhu Sudan Microsoft Research, Cambridge, MA, USA Demetri Terzopoulos University of California, Los Angeles, CA, USA Doug Tygar University of California, Berkeley, CA, USA Gerhard Weikum Max Planck Institute for Informatics, Saarbruecken, Germany Yang Xiang Mukaddim Pathan Xiaohui Tao Hua Wang (Eds.)

Data and Knowledge Engineering

Third International Conference, ICDKE 2012 Wuyishan, Fujian, China, November 21-23, 2012 Proceedings



Volume Editors

Yang Xiang Deakin University School of Information Technology Burwood, VIC, Australia E-mail: yang@deakin.edu.au

Mukaddim Pathan Media Distribution Telstra Corporation Limited Melbourne, VIC, Australia E-mail: mukaddim.pathan@team.telstra.com

Xiaohui Tao The University of Southern Queensland Department of Mathematics and Computing Toowoomba, QLD, Australia E-mail: xtao@usq.edu.au

Hua Wang The University of Southern Queensland Department of Mathematics and Computing Toowoomba, QLD, Australia E-mail: hua.wang@usq.edu.au

ISSN 0302-9743 e-ISSN 1611-3349 ISBN 978-3-642-34678-1 e-ISBN 978-3-642-34679-8 DOI 10.1007/978-3-642-34679-8 Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2012951317

CR Subject Classification (1998): I.2, H.3-5, C.2, J.1, K.6.5

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

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

[©] Springer-Verlag Berlin Heidelberg 2012

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.

Preface

The International Conference on Data and Knowledge Engineering (ICDKE) 2012 was held in WuyiShan, Fujian, China, during November 21–23, 2012, jointly with the 6th International Conference on Network and System Security (NSS 2012) and the 5th International Conference on Internet and Distributed Computing Systems (IDCS 2012). ICDKE 2012 was organized and supported by the School of Mathematics and Computer Science, Fujian Normal University, China, and the Faculty of Sciences, University of Southern Queensland, Australia.

ICDKE is a leading international forum for researchers, developers, and endusers to explore cutting-edge ideas and results for the problems in the data and knowledge fields, and to exchange related techniques and methodologies. The missions of ICDKE are to share novel research solutions to problems of today's information society that fulfill the needs of heterogeneous applications and environments, as well to identify new issues and directions for future research and development.

The First International Conference on Data and Knowledge Engineering (ICDKE 2010) was held in Melbourne, Australia, during September 1–3, 2010; the Second International Conference on Data and Knowledge Engineering (ICDKE 2011) was held in Milan, Italy, during September 6–8, 2011. Following the great success of ICDKE 2010 and 2011, the Third International Conference on Data and Knowledge Engineering (ICDKE 2012) was held in Wuyishan, China, providing a forum for academics and industry practitioners to present research on all practical and theoretical aspects of advanced data-intensive applications, data and knowledge engineering as well as case studies and implementation experiences. ICDKE 2012 gave researchers and practitioners a unique opportunity to share their perspectives with others interested in the various aspects of engineering.

ICDKE 2012 attracted 53 submissions from 11 countries and regions: Australia, Brazil, China, Egypt, France, Germany, Hong Kong, Iran, Ireland, Pakistan, and Tunisia. The review process was rigorous. Each paper was reviewed by at least two reviewers, and most of them reviewed by three to four reviewers. The Program Committee accepted 13 submissions as full papers (giving an approximate acceptance rate of 25%) and seven short papers for inclusions in the proceedings.

We would like to thank the members of the Program Committee and Organizing Committee who contributed to the success of the conference. Last, but certainly not least, our thanks go to all authors and attendees. We hope you enjoy the conference proceedings!

November 2012

Yang Xiang Mukaddim Pathan Xiaohui Tao Hua Wang

ICDKE 2012 Organization

General Co-chairs

Hua Wang	University of Southern Queensland, Australia
Xinyi Huang	Fujian Normal University, China

Program Co-chairs

Xiaohui Tao	University of Southern Queensland, Australia
Hongmin Cai	South China University of Technology, China

Publicity Co-chairs

S. Ramasamy	Computer Society of India, India
Ji Zhang	University of Southern Queensland, Australia
Xiaodong Zhu	Nanjing University of Information Science and
	Technology, China
Lei Zou	Peking University, China

Program Committee

Abdulmohsen Algarni Queensland University of Technology, Australia James Bailey University of Melbourne, Australia Irena Bojanova University of Maryland University College, USA Karima Boudaoud University of Nice, Sophia Antipolis, France Jin Chen Michigan State University, USA Zhong Chen Peking University, China Flavius Frasincar Erasmus University Rotterdam, The Netherlands Naoki Fukuta Shizuoka University, Japan Qigang Gao Dalhousie University, Canada Jihong Guan Tongji University, China Jingzhi Guo University of Macau, China Abdul Hafeez-Baig University of Southern Queensland, Australia Jan Hidders TUDelft, The Netherlands Stephen Huang The University of Houston, USA Shaoquan Jiang University of Calgary, Canada Yuhua Jiao Michigan State University, USA Raymond Y.K. Lau City University of Hong Kong, China Jiuyong Li University of Southern Australia, Australia

Tianrui Li Yidong Li Zhengrong Li Xiaodong Lin Qing Liu Xuezheng Liu Yezheng Liu Yuee Liu Sofian Maabout Nils Muellner Niu Nan Sanaullah Nazir Sudsanguan Ngamsuriyaroj Kok-Leong Ong Kanagasabai Rajaraman Chunming Rong Julian Schutte

Yanfeng Shu Paulo de Souza Hai Wang Ying-Hong Wang Ian Welch Guandong Xu Shin-Jer Yang Chunxia Zhang Yi Zhang Laiping Zhao Yanchang Zhao Emily X. Zhou Xujuan Zhou Southwest Jiaotong University, China Beijing Jiaotong University, China Ergon Energy, Australia University of Ontario Institute of Technology, Canada CSIRO ICT Centre, Australia Google Inc., Beijing, China Hefei University of Technology, China Queensland University of Technology, Australia University of Bordeaux, France University of Oldenburg, Germany Mississippi State University, USA AOL Global Operations Limited, Ireland Mahidol University, Thailand Deakin University, Australia Institute for Infocomm Research (I2R), Singapore University of Stavanger, Norway Fraunhofer Institute for Secure Information Technology, Germany CSIRO ICT Centre, Australia CSIRO ICT Centre, Australia Saint Mary's University, Canada Tamkang University, Taiwan Victoria University of Wellington, New Zealand Victoria University, Australia Soochow University, Taipei, Taiwan Beijing Institute of Technology, China Sichuan University. China Kyushu university, Japan RDataMining, Australia CSIRO ICT Centre, Australia Queensland University of Technology, Australia

Table of Contents

ICDKE: Artificial Intelligence and Data Engineering

OR-Tree: An Optimized Spatial Tree Index for Flash-Memory Storage	
Systems	1
Na Wang, Peiquan Jin, Shouhong Wan, Yinghui Zhang, and	
Lihua Yue	
Directional Skyline Queries	15
Eman El-Dawy, Hoda M.O. Mokhtar, and Ali El-Bastawissy	
Transforming Nescient Activity into Intelligent Activity	29
Rafiqul Haque, Nenad Krdzavac, and Tom Butler	
Self-adaptive Non-stationary Parallel Multisplitting Two-Stage Iterative	
Methods for Linear Systems	38
Guo-Yan Meng, Chuan-Long Wang, and Xi-Hong Yan	
Towards a Case-Based Reasoning Approach Based on Ontologies	
Application to Railroad Accidents	48
Ahmed Maalel, Lassad Mejri, Habib Hadj-Mabrouk, and	
Henda Ben Ghézela	
ICDKE: Knowledge Discovery and Data Management	
An Agile Knowledge Discovery in Databases Software Process	56
Givanildo Santana do Nascimento and	
Adicinéia Aparecida de Oliveira	
An Innovative Outlier Detection Method Using Localized Thresholds	65
Ji Zhang, Jie Cao, and Xiaodong Zhu	
A Self-stabilizing Algorithm for Finding a Minimal K-Dominating Set	
in General Networks	74
Guangyuan Wang, Hua Wang, Xiaohui Tao, and Ji Zhang	
Optimal Combination of Feature Weight Learning and Classification	

Based on Local Approximation

Hongmin Cai and Michael Ng

86

A Model of User-Oriented Reduct Construction Based on Minimal Set	
Cover	95
Suqing Han and Guimei Yin	

ICDKE: Information Extraction and Retrieval

Determining Pattern Similarity in a Medical Recommender System Maytiyanin Komkhao, Jie Lu, and Lichen Zhang	103
Chinese Latent Relational Search Based on Relational Similarity Chao Liang and Zhao Lu	115
 Wikipedia Category Graph and New Intrinsic Information Content Metric for Word Semantic Relatedness Measuring Mohamed Ali Hadj Taieb, Mohamed Ben Aouicha, Mohamed Tmar, and Abdelmajid Ben Hamadou 	128
Nautilus: A Generic Framework for Crawling Deep Web Jianyu Zhao and Peng Wang	141
Retrieving Information from Microblog Using Pattern Mining and Relevance Feedback Cher Han Lau, Xiaohui Tao, Dian Tjondronegoro, and Yuefeng Li	152

ICDKE: Data Security I

A Secure and Efficient Mix Network Especially Suitable for E-Voting <i>Kun Peng</i>	161
Power Analysis Based Reverse Engineering on the Secret Round Function of Block Ciphers	175
PEVS: A Secure Electronic Voting Scheme Using Polling Booths Md. Abdul Based, Joe-Kai Tsay, and Stig Fr. Mjølsnes	189

ICDKE: Data Security II

Certificate-Based Key-Insulated Signature	206
Haiting Du, Jiguo Li, Yichen Zhang, Tao Li, and Yuexin Zhang	
The Generalized Construction and Linear Complexity of Binary Sequences with Three-Level Autocorrelation Values Zuling Chang and Dandan Li	221

Anonymous Hierarchical Identity-Based Encryption in Prime Order	
Groups	230
Yanli Ren, Shuozhong Wang, and Xinpeng Zhang	
Weaknesses of "Security Analysis and Enhancement for Three-Party Password-Based Authenticated Key Exchange Protocol" Muhammad Khurram Khan and Debiao He	243
Author Index	251