Lecture Notes in Computer Science

9357

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

Editorial Board

David Hutchison

Lancaster University, Lancaster, 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, Zürich, Switzerland

John C. Mitchell

Stanford University, Stanford, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

TU Dortmund University, Dortmund, Germany

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Gerhard Weikum

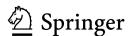
Max Planck Institute for Informatics, Saarbrücken, Germany

More information about this series at http://www.springer.com/series/7409

Ismail Khalil · Erich Neuhold A Min Tjoa · Li Da Xu · Ilsun You (Eds.)

Information and Communication Technology

Third IFIP TC 5/8 International Conference, ICT-EurAsia 2015 and 9th IFIP WG 8.9 Working Conference, CONFENIS 2015 Held as Part of WCC 2015 Daejeon, Korea, October 4–7, 2015 Proceedings



Editors
Ismail Khalil
Institute of Telecooperation
Johannes Kepler University Linz
Linz
Austria

Erich Neuhold
Department of Computer Science
University of Vienna
Vienna
Austria

A Min Tjoa Institute of Software Technology Vienna University of Technology Vienna Austria Li Da Xu Information Technology and Decision Sciences Old Dominion University Norfolk, VA USA

Ilsun You Soon Chun Hyang University Asan South Korea

ISSN 0302-9743 ISSN 1611-3349 (electronic) Lecture Notes in Computer Science ISBN 978-3-319-24314-6 ISBN 978-3-319-24315-3 (eBook) DOI 10.1007/978-3-319-24315-3

Library of Congress Control Number: 2015948857

LNCS Sublibrary: SL3 - Information Systems and Applications, incl. Internet/Web, and HCI

Springer Cham Heidelberg New York Dordrecht London

© IFIP International Federation for Information Processing 2015

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, 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.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made.

Printed on acid-free paper

Springer International Publishing AG Switzerland is part of Springer Science+Business Media (www.springer.com)

Preface

It was a great honor that this year's ICT-EurAsia 2015 and CONFENIS 2015 were held in conjunction with the 23rd IFIP World Computer Congress (WCC 2015), the flagship event of the International Federation for Information Processing (IFIP).

The Information & Communication Technology-EurAsia Conference (ICT-EUR-ASIA 2015) is thought of as an international platform for researchers and practitioners to present their latest research findings and innovations. The conference is especially focused on the very vivid and agile development of ICT-research in the last decade with a special focus on European and Asian developments.

The 2015 Asian Conference on Availability, Reliability, and Security (AsiaARES 2015) was held as a Special Track Conference within ICT-EURASIA 2015 and aimed specifically to improve the flow of IT-security research results to and from the Asian region. The ultimate goal is to establish a community and a meeting point for security researchers and to make travel shorter and the venues more easily accessible for researchers from Asia. Moreover, AsiaARES emphasizes the interplay between foundations and practical issues of security in emerging areas and is devoted to the critical examination and research challenges of the various aspects of secure and dependable computing and the definition of a future road map.

The 2015 edition of the International Conference on Research and Practical Issues of Enterprise Information Systems (CONFENIS 2015) was mainly focused on aspects of big data, text mining, visualization, and impacts of enterprise information systems (EIS). CONFENIS 2015 at WCC provided an international forum for the IFIP community to discuss the latest research findings in the area of EIS. The conference specifically aimed at facilitating the exchange of ideas and advances on all aspects and developments of EIS with the broader ICT-audience present at IFIP WCC 2015.

Both ICT-EurAsia 2015 and CONFENIS 2015 received high-quality submissions from all over the world. After a rigorous peer-reviewing process by the Program Committees a total of 35 papers were accepted for presentation. We believe that the selected papers will trigger further ICT-related research and improvements.

Finally, we would like to give our special thanks to all authors for their valuable contributions as well as to the Program Committee members for their valuable advice. At the same time, we would like to acknowledge the great support of the WCC-2015 conference organization team as well as that of the ICT-EurAsia 2015 and CONFENIS 2015 organization team, in particular Ms. Niina Maarit Novak for her timely help, organization, and contribution which made this edition of the conference proceedings possible.

October 2015

Ismail Khalil Erich Neuhold A Min Tjoa Li Da Xu Ilsun You

Organization

Information & Communication Technology – EurAsia Conference 2015, ICT-EurAsia 2015

General Chairpersons

Erich Neuhold Chairman of IFIP Technical Committee on Information

Technology Application

Chairpersons

Wichian Chutimaskul King Mongkut's University of Technology Thonburi,

Thailand

Isao Echizen National Institute of Informatics, Japan A Min Tioa Vienna University of Technology, Austria Ilsun You Soon Chun Hyang University, South Korea

(Availiability, Reliability and Security Track)

Forrest Lin Chinese Institute of Electronics, China

Program Committee

Ladjel Bellatreche Laboratoire d'Informatique Scientifique et Industrielle,

France

Alfredo Cuzzocrea University of Calabria, Italy

Khabib Mustofa Universitas Gadjah Mada, Indonesia Amin Anjomshoaa Vienna University of Technology, Austria

University of Tokyo, Japan Masatoshi Arikawa Hoang Huu Hanh University of Hue, Vietnam Josef Küng University of Linz, Austria

Ismail Khalil Int. Org. for Information Integration and Web-based

App. & Services

Udayana University, Indonesia Made Sudiana Mahendra University of Regensburg, Germany Günther Pernul Maria Raffai University of Györ, Hungary

Hamideh Afsarmanesh University of Amsterdam, Netherlands

University of Vienna, Austria Gerhard Budin Somchai Chatvichienchai University of Nagasaki, Japan

Key Sun Choi KAIST, South Korea

Tetsuya Furukawa University of Kyushu, Japan Zainal Hasibuan University of Indonesia, Indonesia

VIII Organization

Christian Huemer Vienna University of Technology, Austria

Dieter Kranzlmüller Ludwig-Maximilians-Universität München, Germany

Lenka Lhotska Czech Technical University, Czech Republic Luis M. Camarinha Matos Universidade Nova de Lisboa, Portugal

Bernardo Nugroho Yahya Hankuk University of Foreign Studies, South Korea

Dimitris Karagiannis
Geert Poels
Josaphat Tetuko Sri
University of Vienna, Austria
Ghent University, Belgium
Chiba University, Japan

Sumantyo

Nguyen Tuan University of Information Technology, Vietnam Bundit Thipakorn King Mongkut's University of Technology Thonburi,

Thailand

Valeria De Antonellis University of Brescia, Italy

Phayung Meesad King Mongkut's University of Technology North

Bangkok, Thailand

Nguyen Xuan Hoai Hanoi University, Vietnam

Huynh Quyet Thang
Mauridhi Hery Purnomo
Arif Djunaidy
Hanoi University of Science and Technology, Vietnam
Institut Teknologi Sepuluh Nopember (ITS), Indonesia
Institut Teknologi Sepuluh Nopember (ITS), Indonesia

Mikhail Lavrentyev Novosibirsk State University, Russia

Robert P. Biuk-Aghai University of Macau, China Chandrashekhar Meshram RTM Nagpur University, India

The 2015 Asian Conference on Availability, Reliability, and Security, AsiaARES 2015

Program Committee Chairperson

Ilsun You Soon Chun Hyang University, South Korea

Program Committee

Kensuke Baba Kyushu University, Japan

Jakub Breier NTU, Singapore

Aniello Castiglione Università degli Studi di Salerno, Italy Mala Chelliah National Institute of Technology, India

Hsing-Chung Chen
Xiaofeng Chen
Xidian University, Taiwan
Xiaofeng Chen
Xidian University, China
Northeastern University, China
Adela Georgescu
Vniversity of Bucharest, Romania
Nan Guo
Northeastern University, China

Shinsaku Kiyomoto KDDI R&D Laboratories Inc., Japan

Igor Kotenko SPIRAS, Russia

Fang-Yie Leu Tunghai University, Taiwan

Kazuhiro Minami Institute of Statistical Mathematics, Japan

Masakatsu Nishigaki Shizuoka University, Japan

Marek R. Ogiela AGH University of Sci. and Tech., Poland Francesco Palmieri Università degli Studi di Salerno, Italy

Kouichi Sakurai Kyushu University, Japan

Kunwar Singh National Institute of Technology, India Masakazu Soshi Hiroshima City University, Japan Shiuh-Jeng Wang Central Police University, Taiwan

Shuichiroh Yamamoto Nagoya University, Japan Akihiro Yamamura Akita University, Japan

Siuming Yiu The University of Hong Kong, Hong Kong Qin Xin University of the Faroe Islands, Denmark

Baokang Zhao National University of Defense Technology, China

International Conference on Research and Practical Issues of Enterprise Information Systems – CONFENIS 2015

General Chairperson

Ismail Khalil University of Linz, Austria

Chairperson

Lida Xu Old Dominion University, USA

Program Committee

Rogério Atem de Carvalho Instituto Federal Fluminense, Brazil

Hanh Huu Hoang Hue University, Vietnam

A Min Tjoa Vienna University of Technology, Austria

Sohail S. Chaudhry Villanova University, USA

Amin Anjomshoaa MIT - Massachusetts Institute of Technology, USA Ota Novotny Prague University of Economics, Czech Republic

Charles Møller Aalborg University, Denmark

Josef Basl Prague University of Economics, Czech Republic Petr Doucek Prague University of Economics, Czech Republic Klara Antlova Technical University Liberec, Czech Republic Michel Avital Copenhagen Business School, Denmark

Jan Claes Ghent University, Belgium Geert Poels Ghent University, Belgium

George Feuerlicht University of Economics Prague, Czech Republic

Frederik Gailly Ghent University, Belgium

Bee Hua Goh National University of Singapore, Singapore

Jingzhi Guo University of Macau, China

X Organization

Björn Johansson Lund University, Sweden

Rob Kusters Eindhoven University of Technology, The Netherlands Satish Krishnan Indian Institute of Management (Kozhikode), India

Mehran Misaghi UNISOCIESC, Brazil
Young Moon Syracuse University, USA
Maria Raffai Szechenyi University, Hungary
Muthu Ramachandran Leeds Metropolitan University, UK

Flavia Santoro UNIRIO, Brazil

Petr Sodomka Brno University of Technology, Czech Republic

Frantisek Sudzina Aalborg University, Denmark Per Svejvig Aarhus University, Denmark

Chris Zhang University of Saskatchewan, Canada

Shang-Ming Zhou Swansea University, UK

Hongxun Jiang Renmin University of China, China

Subodh Kesharwani Indira Gandhi National Open University, India Lu Liu Beijing University of Aeronautics and Astronautics,

China

Victor Romanov Russian Plekhanov Academy of Economics, Russia Zhaohao Sun Papua New Guinea University of Technology, Papua

New Guinea

Organizational Coordination Chairperson (ICT-EurAsia, AsiaARES 2015, CONFENIS 2015)

Niina Maarit Novak Vienna University of Technology, Austria

Contents

Networks and System Architecture	
Reducing Keepalive Traffic in Software-Defined Mobile Networks with Port Control Protocol	3
A SDN Based Method of TCP Connection Handover	13
IP Data Delivery in HBB-Next Network Architecture	20
Syn Flood Attack Detection and Type Distinguishing Mechanism Based on Counting Bloom Filter Tomáš Halagan, Tomáš Kováčik, Peter Trúchly, and Andrej Binder	30
Integrating Mobile OpenFlow Based Network Architecture with Legacy Infrastructure	40
Teaching and Education	
Making Computer Science Education Relevant	53
Analyzing Brain Waves for Activity Recognition of Learners	64
Authentication and Profiling	
A Multi-factor Biometric Based Remote Authentication Using Fuzzy Commitment and Non-invertible Transformation Thi Ai Thao Nguyen, Dinh Thanh Nguyen, and Tran Khanh Dang	77
Profiler for Smartphone Users Interests Using Modified Hierarchical Agglomerative Clustering Algorithm Based on Browsing History	89

Data Management and Information Advertising	
Strength of Relationship Between Multi-labeled Data and Labels	99
Online Ad-fraud in Search Engine Advertising Campaigns: Prevention, Detection and Damage Limitation	109
Applied Modeling and Simulation	
Markov Chain Solution to the 3-Tower Problem	121
Fitness Function in ABC Algorithm for Uncapacitated Facility Location Problem	129
Comparative Study of Monte-Carlo Tree Search and Alpha-Beta Pruning in Amazons	139
Network Security	
Can We Securely Use CBC Mode in TLS1.0?	151
Key Agreement with Modified Batch Rekeying for Distributed Group in Cognitive Radio Networks	161
Secure Mobility Management for MIPv6 with Identity-Based Cryptography Nan Guo, Fangting Peng, and Tianhan Gao	173
Investigation of DDoS Attacks by Hybrid Simulation	179
Dependable Systems and Applications	
Secure Database Using Order-Preserving Encryption Scheme Based on Arithmetic Coding and Noise Function	193
An Approach for Evaluating Softgoals Using Weight	203

Contents	XIII
An Efficient Unsavory Data Detection Method for Internet Big Data Peige Ren, Xiaofeng Wang, Hao Sun, Fen Xu, Baokang Zhao, and Chunqing Wu	213
Identification of Corrupted Cloud Storage in Batch Auditing for Multi-Cloud Environments	221
Multimedia Security	
Face Recognition Performance Comparison Between Real Faces and Pose Variant Face Images from Image Display Device	229
A Lossless Data Hiding Strategy Based on Two-Dimensional Side-Match Predictions	235
Secure Image Deduplication in Cloud Storage	243
Cryptography	
Hybrid Encryption Scheme Using Terminal Fingerprint and Its Application to Attribute-Based Encryption Without Key Misuse	255
Differential Fault Attack on LEA	265
A Secure Multicast Key Agreement Scheme	275
Efficient Almost Strongly Universal Hash Function for Quantum Key Distribution: Extended Abstract	282
Big Data and Text Mining	
DCODE: A Distributed Column-Oriented Database Engine for Big Data Analytics	289
Incorporating Big Data Analytics into Enterprise Information Systems Zhaohao Sun, Francisca Pambel, and Fangwei Wang	300

XIV Contents

Analytical Platform Based on Jbowl Library Providing Text-Mining Services in Distributed Environment	310
Social Impact of EIS and Visualization	
Corporate Social Responsibility in Social Media Environment	323
Usage of Finance Information Systems in Developing Countries: Identifying Factors During Implementation that Impact Use	333
Software Model Creation with Multidimensional UML	343
Author Index	353