

Communications
in Computer and Information Science

130

Mohammad S. Obaidat Joaquim Filipe (Eds.)

e-Business and Telecommunications

6th International Joint Conference, ICETE 2009
Milan, Italy, July 7-10, 2009
Revised Selected Papers

Volume Editors

Mohammad S. Obaidat
Monmouth University
West Long Branch, NJ, USA
E-mail: obaidat@monmouth.edu

Joaquim Filipe
INSTICC and IPS
Estefanilha, Setúbal, Portugal
E-mail: joaquim.filipe@estsetubal.ips.pt

ISSN 1865-0929
ISBN 978-3-642-20076-2
DOI 10.1007/978-3-642-20077-9
Springer Heidelberg Dordrecht London New York

e-ISSN 1865-0937
e-ISBN 978-3-642-20077-9

Library of Congress Control Number: 2011923681

CR Subject Classification (1998): C.2, J.1, K.4.4, K.6.5, K.4.2, D.4.6

© Springer-Verlag Berlin Heidelberg 2011

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.

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)

Preface

The present book includes extended and revised versions of a set of selected best papers from the 6th International Joint Conference on e-Business and Telecommunications (ICETE), which was held in July 2009, in Milan, Italy. This conference reflects a continuing effort to increase the dissemination of recent research results among professionals who work in the areas of e-business and telecommunications. ICETE is a joint international conference integrating four major areas of knowledge that are divided into four corresponding conferences: ICE-B (International Conference on e-Business), SECRYPT (International Conference on Security and Cryptography), WINSYS (International Conference on Wireless Information Systems) and SIGMAP (International Conference on Signal Processing and Multimedia).

The program of this joint conference included several outstanding keynote lectures presented by internationally renowned distinguished researchers who are experts in the various ICETE areas. Their keynote speeches contributed to heighten the overall quality of the program and significance of the theme of the conference.

The conference topic areas define a broad spectrum in the key areas of e-business and telecommunications. This wide-view reporting made ICETE appealing to a global audience of engineers, scientists, business practitioners, ICT managers and policy experts. The papers accepted and presented at the conference demonstrated a number of new and innovative solutions for e-business and telecommunication networks and systems, showing that the technical problems in these closely related fields are challenging and worthwhile to approach with an interdisciplinary perspective such as that promoted by ICETE.

ICETE 2009 received 300 papers in total, with contributions from 50 different countries, in all continents, which really shows the success and global dimension of the conference. To evaluate each submission, a double-blind paper evaluation method was used; each paper was reviewed by at least two experts from the International Program Committee, and most papers received three reviews or even more. In the end, 114 papers were selected for oral presentation and publication, corresponding to a 38% acceptance ratio. Of these only 34 were accepted as full papers (11% of submissions) and 80 as short papers. Additionally, 51 papers were accepted for poster presentation.

We hope that you will find this collection of the best ICETE 2009 papers an excellent source of inspiration as well as a helpful reference for research in the aforementioned areas.

July 2010

Joaquim Filipe
Mohammad S. Obaidat

Conference Committee

Conference Co-chairs

Joaquim Filipe	Polytechnic Institute of Setúbal / INSTICC, Portugal
Mohammad S. Obaidat	Monmouth University, USA

Program Co-chairs

Pedro Assunção	Polytechnic Institute of Leiria, Portugal (SIGMAP)
Rafael Caldeirinha	Polytechnic Institute of Leiria, Portugal (WINSYS)
Sérgio Faria	Polytechnic Institute of Leiria, Portugal (SIGMAP)
Eduardo Fernández-medina	University of Castilla-La Mancha, Spain (SECURITY)
Javier Hernando	Technical University of Catalonia, Spain (SECURITY)
Manu Malek	Stevens Institute of Technology, USA (SECURITY)
David Marca	University of Phoenix, USA (ICE-B)
Mohammad S. Obaidat	Monmouth University, USA (WINSYS)
Boris Shishkov	IICREST / Delft University of Technology, The Netherlands (ICE-B)
Marten Van Sinderen	University of Twente, The Netherlands (ICE-B)

Organizing Committee

Sérgio Brissos	INSTICC, Portugal
Helder Coelhas	INSTICC, Portugal
Vera Coelho	INSTICC, Portugal
Andreia Costa	INSTICC, Portugal
Bruno Encarnaçao	INSTICC, Portugal
Bárbara Lima	INSTICC, Portugal
Raquel Martins	INSTICC, Portugal
Elton Mendes	INSTICC, Portugal
Carla Mota	INSTICC, Portugal
Vitor Pedrosa	INSTICC, Portugal

Mónica Saramago
José Varela
Pedro Varela

INSTICC, Portugal
INSTICC, Portugal
INSTICC, Portugal

ICE-B Program Committee

Geetha Abeysinghe, UK
Osman Abul, Turkey
Shakil Ahktar, USA
Fahim Akhter, UAE
Antonia Albani, The Netherlands
Panagiotes Anastasiades, Greece
Anteneh Ayanso, Canada
Gilbert Babin, Canada
Eduard Babulak, Canada
Ladjel Belllatreche, France
Morad Benyoucef, Canada
Jun Bi, China
Ch. Bouras, Greece
Andrei Broder, USA
Erik Buchmann, Germany
Rebecca Bulander, Germany
Christer Carlsson, Finland
Michelangelo Ceci, Italy
Wojciech Cellary, Poland
Patrick Y.K. Chau, Hong Kong
Dickson Chiu, China
Soon Chun, USA
Jen-Yao Chung, USA
Michele Colajanni, Italy
Rafael Corchuelo, Spain
Hepu Deng, Australia
Peter Dolog, Denmark
Khalil Drira, France
Yanqing Duan, UK
Erwin Fieft, Australia
Flavius Frasinca, The Netherlands
George Giaglis, Greece
Claude Godart, France
Paul Grefen, The Netherlands
Giovanna Guerrini, Italy
Mohand Saïd Hacid, France
Hyoil Han, USA
G. Harindranath, UK
Milena Head, Canada

Birgit Hofreiter, Austria
Weihong Huang, UK
Christian Huemer, Austria
Ela Hunt, UK
Arun Iyengar, USA
Nallani Chackravartula Sriman
Narayana Iyengar, India
Ibrahim Kushchu, UK
Anton Lavrin, Slovak Republic
Dahui Li, USA
Yinsheng Li, China
Chin Lin, Taiwan
Sebastian Link, New Zealand
Liping Liu, USA
Hui Ma, New Zealand
Zaki Malik, USA
Tokuro Matsuo, Japan
Gavin McArdle, Ireland
Jan Mendling, Germany
Brian Mennecke, USA
Paolo Merialdo, Italy
Adrian Mocan, Germany
Ali Reza Montazemi, Canada
Maurice Mulvenna, UK
Mieczyslaw Muraszkiwicz, Poland
Li Niu, Australia
Dan O'Leary, USA
Dana Petcu, Romania
Krassie Petrova, New Zealand
Pascal Poncelet, France
Pak-Lok Poon, China
Philippou Pouyioutas, Cyprus
Ana Paula Rocha, Portugal
Joel Rodrigues, Portugal
Gustavo Rossi, Argentina
David Ruiz, Spain
Jarogniew Rykowski, Poland
Markus Schneider, USA
Timos Sellis, Greece

Quah Tong Seng, Singapore
 Sushil Sharma, USA
 Quan Z. Sheng, Australia
 Mario Spremic, Croatia
 Zhaohao Sun, Australia
 Thompson Teo, Singapore
 Ramayah Thurasamy, Malaysia
 Thanassis Tiropanis, UK

Laurentiu Vasiliu, Ireland
 Tomas Vitvar, Austria
 Adam Vrechopoulos, Greece
 Michael Weiss, Canada
 Jongwook Woo, USA
 Lai Xu, Switzerland
 Guangquan Zhang, Australia
 Constantin Zopounidis, Greece

ICE-B Auxiliary Reviewer

José María García, Spain

SECRYPT Program Committee

Sudhir Aggarwal, USA
 Isaac Agudo, Spain
 Gail-joon Ahn, USA
 Luiz Carlos Pessoa Albini, Brazil
 Eduard Babulak, Canada
 Yun Bai, Australia
 Dan Bailey, USA
 Ken Barker, Canada
 Peter Bertok, Australia
 Carlo Blundo, Italy
 Indranil Bose, Hong Kong
 Richard R. Brooks, USA
 Gil Pino Caballero, Spain
 Roy Campbell, USA
 Zhenfu Cao, China
 Chin-Chen Chang, Taiwan
 Rocky K.C. Chang, Hong Kong
 Pascale Charpin, France
 Yu Chen, USA
 Zesheng Chen, USA
 Stelvio Cimato, Italy
 Debbie Cook, USA
 Nathalie Dagorn, France
 Paolo D'arco, Italy
 Anupam Datta, USA
 Bart De Decker, Belgium
 Shlomi Dolev, Israel
 Robin Doss, Australia
 Nicola Dragoni, Denmark

Falko Dressler, Germany
 Robert Erbacher, USA
 Eduardo B. Fernandez, USA
 Simone Fischer-Hübner, Sweden
 Mariagrazia Fugini, Italy
 Steven Furnell, UK
 Carlos Goulart, Brazil
 Lisandro Granville, Brazil
 Rüdiger Grimm, Germany
 Stefanos Gritzalis, Greece
 Drew Hamilton, USA
 Javier Hernando, Spain
 Amir Herzberg, Israel
 Alejandro Hevia, Chile
 Jiankun Hu, Australia
 Min-Shiang Hwang, Taiwan
 Markus Jakobsson, USA
 Christian Damsgaard Jensen,
 Denmark
 Hai Jiang, USA
 Dong Seong Kim, USA
 Seungjoo Kim, Korea, Republic of
 Michael Kounavis, USA
 Evangelos Kranakis, Canada
 Ralf Kuesters, Germany
 Chi-Sung Laih, Taiwan
 Chin-Laung Lei, Taiwan
 Albert Levi, Turkey
 Shiguo Lian, China

Antonio Liroy, Italy	Erkay Savas, Turkey
Luis de la Cruz Llopis, Spain	Bruno Schulze, Brazil
Olivier Ly, France	Dimitrios Serpanos, Greece
Khamish Malhotra, UK	Alice Silverberg, USA
Yoshifumi Manabe, Japan	Haoyu Song, USA
Olivier Markowitch, Belgium	Paul Spirakis, Greece
Gianluigi Me, Italy	Mario Spremic, Croatia
Ali Miri, Canada	Yannis Stamatiou, Greece
Atsuko Miyaji, Japan	Aaron Striegel, USA
Mohamed Mosbah, France	Willy Susilo, Australia
Yi Mu, Australia	Kitt Tientanopajai, Thailand
Jalal Al Muhtadi, Saudi Arabia	Ferucio Laurentiu Tiplea, Romania
James Muir, Canada	Jorge E. López de Vergara, Spain
Volker Müller, Luxembourg	Luca Viganò, Italy
Juan Gonzalez Nieto, Australia	Sabrina de Capitani di Vimercati, Italy
José Luis Oliveira, Portugal	Haining Wang, USA
Martin Olivier, South Africa	Hua Wang, Australia
Rolf Oppliger, Switzerland	Lingyu Wang, Canada
Carles Padro, Spain	Xinyuan (Frank) Wang, USA
Günther Pernul, Germany	Mariemma I. Yagüe, Spain
Marinella Petrocchi, Italy	Wei Yan, USA
Raphael C.-w. Phan, UK	Alec Yasinsac, USA
Roberto Di Pietro, Italy	George Yee, Canada
Krerik Piromsopa, Thailand	Sung-Ming Yen, Taiwan
George Polyzos, Greece	Meng Yu, USA
Miodrag Potkonjak, USA	Ting Yu, USA
Douglas Reeves, USA	Moti Yung, USA
Peter Reiher, USA	Nicola Zannone, The Netherlands
Rodrigo Roman, Spain	Fanguo Zhang, China
David Samyde, USA	Zhongwei Zhang, Australia
Aldri Santos, Brazil	Sheng Zhong, USA
Susana Sargento, Portugal	André Zúquete, Portugal
Damien Sauveron, France	

SECRYPT Auxiliary Reviewers

Ahmad Roshidi Amran, UK	Divya Kolar, USA
Jean-Philippe Aumasson, Switzerland	Michele Nogueira Lima, France
Hayretin Bahsi, Turkey	Men Long, USA
Balasingham Balamohan, Canada	Behzad Malek, Canada
Sonia Chiasson, Canada	Leonardo Martucci, Sweden
Prokopios Drogkari, Greece	Felipe Mata, Spain
José Luis García-Dorado, Spain	Amit Mishra, India
Ken Grewal, USA	Vincent Naessens, Belgium

Germán Retamosa, Spain
 Jerry Sui, Canada
 Giacomo Victor Mc Evoy Valenzano,
 Brazil

Kristof Verslype, Belgium
 Jie Wang, UK
 Ge Zhang, Sweden

SIGMAP Program Committee

Gwo Giun (Chris) Lee, Taiwan
 Burak Acar, Turkey
 Harry Agius, UK
 João Ascenso, Portugal
 Pradeep K. Atrey, Canada
 Eduard Babulak, Canada
 Azeddine Beghdadi, France
 Adel Belouchrani, Algeria
 Amel Benazza-Benyahia, Tunisia
 Shuvra Bhattacharyya, USA
 Adrian Bors, UK
 Abdesselam Bouzerdoun, Australia
 Jun Cai, Canada
 Wai-Kuen Cham, China
 Chin-Chen Chang, Taiwan
 Liang-Gee Chen, Taiwan
 Shu-Ching Chen, USA
 Ryszard S. Choras, Poland
 Paulo Lobato Correia, Portugal
 José Alfredo Ferreira Costa, Brazil
 Michel Crucianu, France
 Aysegul Cuhadar, Canada
 Rob Evans, Australia
 David Dagan Feng, Australia
 Wu-Chi Feng, USA
 Yun Fu, USA
 Mathew George, USA
 Zabih Ghassemlooy, UK
 Lorenzo Granai, UK
 Christos Grecos, UK
 Mislav Grgic, Croatia
 Patrick Gros, France
 William Grosky, USA
 Malka Halgamuge, Australia
 Omar Ait Hellal, USA
 Hermann Hellwagner, Austria
 Richang Hong, Singapore
 Guo Huaqun, Singapore

Jiri Jan, Czech Republic
 Chehdi Kacem, France
 Mohan Kankanhalli, Singapore
 Michael Kipp, Germany
 Yiannis Kompatsiaris, Greece
 Constantine Kotropoulos, Greece
 C.-C. Jay Kuo, USA
 Jeongkyu Lee, USA
 Jiann-Shu Lee, Taiwan
 Jing Li, UK
 Rastislav Lukac, Canada
 Antonio De Maio, Italy
 Manuel Perez Malumbres, Spain
 Hong Man, USA
 Andreas Maras, Greece
 Tao Mei, China
 Majid Mirmehdi, UK
 Klaus Moessner, UK
 Alejandro Murua, Canada
 Montse Pardas, Spain
 Raffaele Parisi, Italy
 Jong Hyuk Park, Korea, Republic of
 Andrew Perkis, Norway
 Béatrice Pesquet-Popescu, France
 Ashok Popat, USA
 Viktor Prasanna, USA
 Xiaojun Qi, USA
 Gang Qian, USA
 Maria Paula Queluz, Portugal
 Anthony Quinn, Ireland
 Rudolf Rabenstein, Germany
 Matthias Rauterberg, The Netherlands
 Stefan Robila, USA
 Nuno Rodrigues, Portugal
 Brunilde Sanso, Canada
 Shin'ichi Satoh, Japan
 Xiaowei Shao, Japan
 Timothy K. Shih, Taiwan

Mingli Song, China
John Aa. Sorensen, Denmark
Yutaka Takahashi, Japan
Jinhui Tang, Singapore
Dacheng Tao, Singapore
Daniel Thalmann, Switzerland
Abdellatif Benjelloun Touimi, UK
Steve Uhlig, Germany
Meng Wang, China
Zhiyong Wang, Australia

Toyohide Watanabe, Japan
Michael Weber, Germany
Kim-hui Yap, Singapore
Yuan Yuan, UK
Cha Zhang, USA
Tianhao Zhang, USA
Zhi-Li Zhang, USA
Huiyu Zhou, UK
Ce Zhu, Singapore

SIGMAP Auxiliary Reviewers

Sofia Benjebara, Tunisia
Bo Liu, China
Tanaphol Thaipanich, USA

WINSYS Program Committee

Özgür B. Akan, Turkey
Vicente Alarcon-Aquino, Mexico
Shawkat Ali, Australia
Eduard Babulak, Canada
Marinho Barcellos, Brazil
Novella Bartolini, Italy
Bert-Jan van Beijnum,
The Netherlands
Paolo Bellavista, Italy
Luis Bernardo, Portugal
Rajendra V. Boppana, USA
Rebecca Braynard, USA
Jiannong Cao, Hong Kong
Qi Cheng, Australia
Sheng-Tzong Cheng, Taiwan
Young-June Choi, USA
Iñigo Cuiñas, Spain
Arindam Das, USA
Val Dyadyuk, Australia
Tamer Elbatt, USA
Patrik Floreen, Finland
Chuan Heng Foh, Singapore
Shengli Fu, USA
Jie Gao, USA
Damianos Gavalas, Greece

Matthias Hollick, Spain
Raj Jain, USA
Jehn-Ruey Jiang, Taiwan
Eduard Jorswieck, Germany
Abdelmajid Khelil, Germany
Boris Koldehofe, Germany
Vinod Kulathumani, USA
Thomas Kunz, Canada
Wing Kwong, USA
Xu Li, France
Qilian Liang, USA
Chin Lin, Taiwan
Kathy J. Liszka, USA
Hsi-pin Ma, Taiwan
Aniket Mahanti, Canada
Pascale Minet, France
Klaus Moessner, UK
Gero Muehl, Germany
Jean Frederic Myoupo, France
Ed Pinnes, USA
Andreas Pitsillides, Cyprus
Christian Prehofer, Finland
Daniele Puccinelli, Switzerland
Nicholas Race, UK
Rabie Ramadan, Egypt

S.S. Ravi, USA
 Peter Reichl, Austria
 Daniele Riboni, Italy
 António Rodrigues, Portugal
 Michele Rossi, Italy
 Pierluigi Salvo Rossi, Italy
 Jörg Roth, Germany
 Christian Schindelbauer, Germany
 Pablo Serrano, Spain
 Kuei-Ping Shih, Taiwan
 Tor Skeie, Norway
 Shensheng Tang, USA

Cesar Vargas-Rosales, Mexico
 Enrique Vazquez, Spain
 Dimitrios Vergados, Greece
 Yu Wang, USA
 Muhammed Younas, UK
 Ming Yu, USA
 Hans-Jurgen Zepernick, Sweden
 Yu Zheng, China
 Hao Zhu, USA
 Yanmin Zhu, China
 Artur Ziviani, Brazil

WINSYS Auxiliary Reviewers

Johnathan Ishmael, UK
 Hai Ngoc Pham, Norway

Aggeliki Sgora, Greece
 Pedro Vieira, Portugal

Invited Speakers

Blagovest Shishkov
 Pierangela Samarati
 David Marca
 Frank Leymann
 Gottfried Vossen

Bulgarian Academy of Sciences,
 Bulgaria
 University of Milan, Italy
 University of Phoenix, USA
 University of Stuttgart, Germany
 University of Münster, Germany

Table of Contents

Invited Papers

Stochastic Modeling and Statistical Inferences of Adaptive Antennas in Wireless Communications	3
<i>Blagovest Shishkov</i>	
Protecting Information Privacy in the Electronic Society	20
<i>Sabrina De Capitani di Vimercati, Sara Foresti, and Pierangela Samarati</i>	
The Three Fundamental e-Business Models	37
<i>David A. Marca</i>	
Web 2.0: From a Buzzword to Mainstream Web Reality	53
<i>Gottfried Vossen</i>	

Part I: e-Business

Exploring Price Elasticity to Optimize Posted Prices in e-Commerce	71
<i>Burkhardt Funk</i>	
Designing Digital Marketplaces for Competitiveness of SMEs in Developing Countries	82
<i>Valentina Ndou, Pasquale Del Vecchio, and Laura Schina</i>	
Strategic Planning, Environmental Dynamicity and Their Impact on Business Model Design: The Case of a Mobile Middleware Technology Provider	94
<i>Antonio Ghezzi, Andrea Rangone, and Raffaello Balocco</i>	
Collaboration Strategies in Turbulent Periods: Effects of Perception of Relational Risk on Enterprise Alliances	110
<i>Marco Remondino, Marco Pironti, and Paola Pisano</i>	
A Classification Schema for Mobile-Internet 2.0 Applications	126
<i>Marcelo Cortimiglia, Filippo Renga, and Andrea Rangone</i>	
Plug and Play Transport Chain Management: Agent-Based Support to the Planning and Execution of Transports	139
<i>Paul Davidsson, Johan Holmgren, Jan A. Persson, and Andreas Jacobsson</i>	

Part II: Security and Cryptography

Exploiting Crosstalk Effects in FPGAs for Generating True Random Numbers 159
Octavian Creț, Radu Tudoran, Alin Suciu, and Tamas Györfi

Offline Peer-to-Peer Broadcast with Anonymity 174
Shinsaku Kiyomoto, Kazuhide Fukushima, and Keith M. Martin

Wireless Authentication and Transaction-Confirmation Token 186
Daniel V. Bailey, John Brainard, Sebastian Rohde, and Christof Paar

Optimizations for High-Performance IPsec Execution 199
Michael G. Iatrou, Artemios G. Voyiatzis, and Dimitrios N. Serpanos

An Efficient Protocol for Authenticated Group Key Agreement in Heterogeneous Networks 212
Mounita Saha and Dipanwita RoyChowdhury

Privacy Enhancements for Hardware-Based Security Modules 224
Vijayakrishnan Pasupathinathan, Josef Pieprzyk, and Huaxiong Wang

Flexible and Time-Based Anonymous Access Restrictions 237
Kristof Verslype and Bart De Decker

Part III: Signal Processing and Multimedia Applications

Robust Numeric Set Watermarking: Numbers Don't Lie 253
Gaurav Gupta, Josef Pieprzyk, and Mohan Kankanhalli

Corrupting Noise Estimation Based on Rapid Adaptation and Recursive Smoothing 266
François Xavier Nsabimana, Vignesh Subbaraman, and Udo Zölzer

Recommender System: A Personalized TV Guide System 278
Paulo Muniz de Ávila and Sérgio Donizetti Zorzo

An Enhanced Concept of a Digital Radio Incorporating a Multimodal Interface and Searchable Spoken Content 291
Günther Schatter and Andreas Eiselt

Part IV: Wireless Information Networks and Systems

Modulation-Mode Assignment in Iteratively Detected and SVD-Assisted Broadband MIMO Schemes 307
Andreas Ahrens and César Benavente-Peces

Wireless Sensor Resource Usage Optimisation Using Embedded State Predictors	320
<i>David Lowe, Steve Murray, and Xiaoying Kong</i>	
A Self-configuring Middleware Solution for Context Management	332
<i>Tudor Cioara, Ionut Anghel, and Ioan Salomie</i>	
Device Whispering: An Approach for Directory-Less WLAN Positioning	346
<i>Karl-Heinz Krempels, Sebastian Patzak, Janno von Stülpnagel, and Christoph Terwelp</i>	
Author Index	359