

Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering

99

Editorial Board

Ozgur Akan

Middle East Technical University, Ankara, Turkey

Paolo Bellavista

University of Bologna, Italy

Jiannong Cao

Hong Kong Polytechnic University, Hong Kong

Falko Dressler

University of Erlangen, Germany

Domenico Ferrari

Università Cattolica Piacenza, Italy

Mario Gerla

UCLA, USA

Hisashi Kobayashi

Princeton University, USA

Sergio Palazzo

University of Catania, Italy

Sartaj Sahni

University of Florida, USA

Xuemin (Sherman) Shen

University of Waterloo, Canada

Mircea Stan

University of Virginia, USA

Jia Xiaohua

City University of Hong Kong, Hong Kong

Albert Zomaya

University of Sydney, Australia

Geoffrey Coulson

Lancaster University, UK

Christos K. Georgiadis Hamid Jahankhani
Elias Pimenidis Rabih Bashroush
Ameer Al-Nemrat (Eds.)

Global Security, Safety and Sustainability & e-Democracy

7th International and 4th e-Democracy
Joint Conferences, ICGS3/e-Democracy 2011
Thessaloniki, Greece, August 24-26, 2011
Revised Selected Papers

Volume Editors

Christos K. Georgiadis
University of Macedonia
Department of Applied Informatics
156 Egnatia Street, 54006 Thessaloniki, Greece
E-mail: geor@uom.gr

Hamid Jahankhani
Elias Pimenidis
Rabih Bashroush
Ameer Al-Nemrat
University of East London
School of Architecture Computing & Engineering
Docklands Campus 4-6, University Way
London E16 2RD, UK
E-mails:
{hamid.jahankhani; e.pimenidis; r.bashroush; a.al-nemrat}@uel.ac.uk

ISSN 1867-8211	e-ISSN 1867-822X
ISBN 978-3-642-33447-4	e-ISBN 978-3-642-33448-1
DOI 10.1007/978-3-642-33448-1	

Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: Applied for

CR Subject Classification (1998): K.4.4, K.4.1, K.6.5, H.4.1, H.5.5, J.1, C.2.0-1, F.2.2

© ICST Institute for Computer Science, Social Informatics and Telecommunications Engineering 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.

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)

Foreword

The annual International Conference on Global Security, Safety and Sustainability is an established platform in which security, safety, and sustainability issues can be examined from several global perspectives through dialogue between academics, students, government representatives, chief executives, security professionals, and research scientists from the UK and from around the globe.

The three-day conference in 2011 focused on the challenges of complexity, the rapid pace of change, and risk/opportunity issues associated with modern products, systems, special events, and infrastructures.

In an era of unprecedented volatile political and economic environments across the world, computer-based systems face ever more increasing challenges, disputes, and responsibilities. Their role in facilitating secure economic transactions and maintaining steady and reliable sources of information that support politically stable and sustainable socioeconomic systems is becoming increasingly critical. Under such a spectrum of issues, the 7th International Conference on Global Security, Safety and Sustainability and the 4th Conference on e-Democracy were jointly organized.

The conferences provided coverage of a wider spectrum of related topics and enhanced incentives for academic debate with a sharply focused critical evaluation of researchers' results from innovative applications of methodologies and applied technologies.

ICGS3 2011 and eDemocracy received paper submissions from more than 12 countries in all continents. Only 37 papers were selected and were presented as full papers. The program also included three keynote lectures by leading researchers, security professionals, and government representatives.

September 2011

Hamid Jahankhani

ICGS3/e-Democracy 2011 Conference Organization

General Chair

Hamid Jahankhani

University of East London, UK

Local Organizing Chairs

Christos K. Georgiadis

University of Macedonia, Greece

Elias Pimenidis

University of East London, UK

Organizers

University of Macedonia, Department of Applied Informatics Thessaloniki, Greece

University of East London, School of Computing, IT and Engineering, UK

Scientific Council for Information Society, Greece

Organizing Committee

Devon Bennett

University of East London, UK

Vasilios Katos

Democritus University of Thrace, Greece

Panagiotis Katsaros

Aristotle University of Thessaloniki, Greece

Costas Lambrinoudakis

University of Piraeus, Greece

Sin Wee Lee

University of East London, UK

Ioannis Mavridis

University of Macedonia, Greece

Ioannis Stamatiou

University of Ioannina, Greece

Vasilios Zorkadis

Directorate of the Hellenic Data Protection
Authority, Greece

Program Chairs

Ameer Al Nemrat

University of East London, UK

Rabih Bashroush

University of East London, UK

Ken Dick

Nebraska University Center for Information
Assurance, USA

Program Committee

Talal Alkharobi	Kings Fahad University of Petroleum and Minerals, Saudi Arabia
Muhammad Ali Babar	IT University of Copenhagen, Denmark
Miltiades Anagnostou	National Technical University of Athens, Greece
Alexandros Chatzigeorgiou	University of Macedonia, Greece
Ali Chehab	American University of Beirut, Lebanon
Mohammad Dastbaz	University of East London, UK
Christos Douligeris	University of Piraeus, Greece
Orhan Gemikonakl	Middlesex University, UK
Christos K. Georgiadis	University of Macedonia, Greece
Wasif Gilani	SAP (UK), UK
George A. Gravvanis	Democritus University of Thrace, Greece
Valiantsin Hardzeeyeu	Ilmenau University, Germany
Ali Hessami	Vega Systems, UK
Lazaros Iliadis	Democritus University of Thrace, Greece
Christos Ilioudis	A. T. E. I. of Thessaloniki, Greece
Shareeful Islam	University of East London, UK
Hossein Jahankhani	University of East London, UK
Konstantinos Kardaras	Technical Consultant, Greece
Vasilios Katos	Democritus University of Thrace, Greece
Panagiotis Katsaros	Aristotle University of Thessaloniki, Greece
Petros Kefalas	City College/University of Sheffield, Greece
Panayiotis H. Ketikidis	City College/University of Sheffield, Greece
Costas Lambrinoudakis	University of Piraeus, Greece
George Loukeris	Scientific Council for Information Society, Greece
Ioannis Manolopoulos	Aristotle University of Thessaloniki, Greece
Konstantinos Margaritis	University of Macedonia, Greece
Ioannis Mavridis	University of Macedonia, Greece
Gianluigi Me	University of Rome Tor Vergata, Italy
Haralambos Mouratidis	University of East London, UK
Hamid R. Nemati	The University of North Carolina at Greensboro, USA
George Pangalos	Aristotle University of Thessaloniki, Greece
Elias Pimenidis	University of East London, UK
Despina Polemi	University of Piraeus, Greece
Kenneth Revett	The British University in Egypt, Egypt
Konstantin Sack	Cyber and Computer Forensic Investigation Unit, Police Headquarters of South Hesse, Germany
Ali Sanayei	University of Isfahan, Iran
Henrique M.D. Santos	University of Minho, Portugal

Alexander Sideridis	Agricultural University of Athens, Greece
Ioannis Stamatiou	University of Ioannina, Greece
Demosthenis Stamatis	A. T. E. I. of Thessaloniki, Greece
Amie Taal	Forensics Associate Director, Grant Thornton, UK
Sérgio Tenreiro de Magalhães	Catholic University of Portugal, Portugal
Sufian Yousef	Anglia Ruskin University, UK
Irini Vassilaki	Scientific Council for Information Society, Greece
David Lilburn Watson	Forensic Computing Ltd., UK
George Weir	University of Strathclyde, UK
Michalis Xenos	Hellenic Open University, Greece
Vasilios Zorkadis	Directorate of the Hellenic Data Protection Authority, Greece

Publicity Chairs

Hossein Jahankhani	University of East London, UK
Despoina Polemi	University of Piraeus, Greece
Zoe Kardasiadou	Hellenic Data Protection Authority, Greece

Secretarial and Technical Support

Eugenia Papaioannou	University of Macedonia, Greece
Apostolos Provatidis	University of Macedonia, Greece
Nikos Vesypoulos	University of Macedonia, Greece

Table of Contents

Transforming Vehicles into e-government 'Cloud Computing' Nodes	1
<i>Dellios Kleanthis, Chronakis Aristeidis, and Polemi Despina</i>	
Maximum Entropy Oriented Anonymization Algorithm for Privacy Preserving Data Mining	9
<i>Stergios G. Tsiafoulis, Vasilios C. Zorkadis, and Elias Pimenidis</i>	
Practical Password Harvesting from Volatile Memory	17
<i>Stavroula Karayianni and Vasilios Katos</i>	
Applied Phon Curve Algorithm for Improved Voice Recognition and Authentication	23
<i>B.L. Tait</i>	
Tuning the Epidemical Algorithm in Wireless Sensor Networks	31
<i>Kostis Gerakos, Christos Anagnostopoulos, and Stathes Hadjiefthymiades</i>	
A Robustness Testing Method for Network Security	38
<i>Yulong Fu and Ousmane Kone</i>	
Economic Evaluation of Interactive Audio Media for Securing Internet Services	46
<i>Theodosios Tsiakis, Panagiotis Katsaros, and Dimitris Gritzalis</i>	
On the Evolution of Malware Species	54
<i>Vasileios Vlachos, Christos Ilioudis, and Alexandros Papanikolaou</i>	
PINEPULSE: A System to PINpoint and Educate Mobile Phone Users with Low Security	62
<i>Iosif Androulidakis and Gorazd Kandus</i>	
GSi Compliant RAS for Public Private Sector Partnership	67
<i>Fawzi Fawzi, Rabih Bashroush, and Hamid Jahankhani</i>	
A Probabilistic Key Agreement Scheme for Sensor Networks without Key Predistribution	72
<i>Vasiliki Liagkou, Effie Makri, Paul Spirakis, and Yannis Stamatiou</i>	
Cryptographic Dysfunctionality-A Survey on User Perceptions of Digital Certificates	80
<i>Dimitrios Zissis, Dimitrios Lekkas, and Panayiotis Koutsabasis</i>	

Towards Colored Petri Net Modeling of Expanded C-TMAC.....	88
<i>Apostolos K. Provatidis, Christos K. Georgiadis, and Ioannis K. Mavridis</i>	
Leveraging the e-passport PKI to Achieve Interoperable Security for e-government Cross Border Services	96
<i>Dimitrios Lekkas and Dimitrios Zissis</i>	
Genre-Based Information Hiding	104
<i>Russell Ogilvie and George R.S. Weir</i>	
In the Hacker's Eye: The Neurophysiology of a Computer Hacker	112
<i>Wael Khalifa, Kenneth Revett, and Abdel-Badeeh Salem</i>	
Untangling Public Service Usage for Agribusinesses with Dialogic E-government	120
<i>Sotiris Karetsos, Maria Ntaliani, Constantina Costopoulou, and Alexander B. Sideridis</i>	
On the Deployment of Artificial Immune Systems for Biometrics	126
<i>Ruben Krishnamurthy, Kenneth Revett, and Hossein Jahankhani</i>	
A Prediction Model for Criminal Levels Specialized in Brazilian Cities	131
<i>Marcelo Damasceno de Melo, Jerffeson Teixeira, and Gustavo Campos</i>	
MASSIF: A Promising Solution to Enhance Olympic Games IT Security	139
<i>Elsa Prieto, Rodrigo Diaz, Luigi Romano, Roland Rieke, and Mohammed Achemlal</i>	
An Ontology-Based Model for SIEM Environments	148
<i>Gustavo Gonzalez Granadillo, Yosra Ben Mustapha, Nabil Hachem, and Herve Debar</i>	
Analyzing the Economic Impacts of Security Breaches Due to Outsourcing	156
<i>Dimitrios Koumaridis, Emmanouil Stiakakis, and Christos K. Georgiadis</i>	
Study of the Perception on the Portuguese Citizen Card and Electronic Signature	164
<i>Isabel Cerqueira, Vítor J. Sá, and Sérgio Tenreiro de Magalhães</i>	

Securing Transportation-Critical Infrastructures: Trends and Perspectives	171
<i>Marianthi Theoharidou, Miltiadis Kandias, and Dimitris Gritzalis</i>	
E-Government in Greece: Serving State's Economic Needs – Respecting the Fundamental Right to Data Protection	179
<i>Zoe Kardasiadou, Evi Chatziliasi, and Konstantinos Limniotis</i>	
Cryptanalysis and Enhancement of a Secure Group Ownership Transfer Protocol for RFID Tags.....	186
<i>Hoda Jannati and Abolfazl Falahati</i>	
Paving the Way for a Transformational Public Administration	194
<i>Ioannis Savvas, Nick Bassiliades, Elias Pimenidis, and Alexander B. Sideridis</i>	
Cybercrime: The Case of Obfuscated Malware	204
<i>Mamoun Alazab, Sitalakshmi Venkatraman, Paul Watters, Moutaz Alazab, and Ammar Alazab</i>	
Feeling Secure vs. Being Secure the Mobile Phone User Case	212
<i>Iosif Androulidakis and Gorazd Kandus</i>	
A Collaborative System Offering Security Management Services for SMEs/mEs.....	220
<i>Theodoros Ntouskas, Dimitrios Papanikas, and Nineta Polemi</i>	
A Situational Awareness Architecture for the Smart Grid	229
<i>Anastasia Mavridou and Mauricio Papa</i>	
Alleviating SMEs' Administrative Burdens: The Rural Inclusion Initiative.....	237
<i>Maria Ntaliani, Constantina Costopoulou, and Alexander B. Sideridis</i>	
Optimum Hardware-Architecture for Modular Divider in $GF(2^m)$ with Chaos as Arbitrary Source Based on ECC.....	245
<i>Azar Hosseini and Abolfazl Falahati</i>	
Sufficiency of Windows Event Log as Evidence in Digital Forensics	253
<i>Nurdeen M. Ibrahim, Ameer Al-Nemrat, Hamid Jahankhani, and Rabih Bashroush</i>	
An Evaluation of the Initiatives and the Progress Made on e-government Services in the EU	263
<i>Alexander B. Sideridis, Elias Pimenidis, Loucas Protopappas, and M. Koukouli</i>	

Improved Awareness on Fake Websites and Detecting Techniques	271
<i>Hossein Jahankhani, Thulasirajh Jayaraveendran, and</i> <i>William Kapuku-Bwabw</i>	
Study of the Perception on the Biometric Technology by the Portuguese Citizens	280
<i>Daniela Borges, Vítor J. Sá, Sérgio Tenreiro de Magalhães, and</i> <i>Henrique Santos</i>	
Author Index	289