



ADVANCES in DATA NETWORKS, COMMUNICATIONS, COMPUTERS

**9th WSEAS International Conference on DATA NETWORKS,
COMMUNICATIONS, COMPUTERS (DNCOCO '10)**

**University of Algarve, Faro, Portugal
November 3-5, 2010**

ADVANCES in DATA NETWORKS, COMMUNICATIONS, COMPUTERS

**9th WSEAS International Conference on DATA NETWORKS,
COMMUNICATIONS, COMPUTERS (DNCOCO '10)**

**University of Algarve, Faro, Portugal
November 3-5, 2010**

Published by WSEAS Press

www.wseas.org

Copyright © 2010, by WSEAS Press

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.

See also: <http://www.worldses.org/review/index.html>

ISSN: 1792-6157

ISBN: 978-960-474-245-5



World Scientific and Engineering Academy and Society

ADVANCES in DATA NETWORKS, COMMUNICATIONS, COMPUTERS

**9th WSEAS International Conference on DATA NETWORKS,
COMMUNICATIONS, COMPUTERS (DNCOCO '10)**

**University of Algarve, Faro, Portugal
November 3-5, 2010**

Editors:

Nikos E. Mastorakis, Technical University of Sofia, BULGARIA and Hellenic Naval Academy, GREECE
Valeri Mladenov, Technical University of Sofia, BULGARIA

International Program Committee Members:

Joao Guerreiro, PORTUGAL
Teresa Noronha, PORTUGAL
Efigenio da Luz Rebelo, PORTUGAL
Luis Chicharo, PORTUGAL
Jon Bryan Burley, USA
Tomas Boski, PORTUGAL
Lea Orlovsky, ISRAEL
Jose Beltrao, PORTUGAL
Teresa Andresen, PORTUGAL
Luis Ribeiro, PORTUGAL
Rui Guerra, PORTUGAL
Inga Straupe, LATVIA
Dulce Antunes, PORTUGAL
Maria de Belem Martins, PORTUGAL
Maria Bostenaru, ROMANIA
Felipa Lopes dos Reis, PORTUGAL
Livia Madureira, PORTUGAL
Nuno Pinto, PORTUGAL
Carlos Guerrero, PORTUGAL
Claudine Metral, SWITZERLAND
Ioannis Tsalikidis, GREECE
C. Helmis, GREECE
F. Rigas, GREECE
N. Afgan, PORTUGAL
F. Akgun, TURKEY
Omar Badran, JORDAN
Y. Baudoin, BELGIUM
A. Bitoleanu, ROMANIA
L. Boch-Andersen, BELGIUM
P. Casero, SPAIN
E. Frey, GERMANY
M. Heiermann, GERMANY
A. E. Holdo, UK
D. De Keukeleere, BELGIUM
M. Versan Kok, TURKEY
G. Kolb, DENMARK
A. Kurbatskiy, RUSSIA
S. Linderoth, DENMARK
P. Lunghi, ITALY
C. Machens, GERMANY
A. Midilli, CANADA
J. Van Mierlo, BELGIUM
S. Ozdogan, TURKEY
M. Reijalt, ITALY
J. Rogut, POLAND
I. V. Singh, INDIA
E. Smole, AUSTRIA
R. Tamme, GERMANY
M. Teixeira, PORTUGAL
R. Vigotti, ITALY
G. Wolf, GERMANY
G. Wisniewski, POLAND
A. Van Zyl, BELGIUM
Z. A. Vale, PORTUGAL
A. F. Zobaa, EGYPT
Metin Demiralp, TURKEY
Valeri Mladenov, BULGARIA
Zoran Bojkovic, SERBIA
Leon Trilling, USA
D. Perkins, USA
Dionysios (Dion) D. Dionysiou, USA
Leonid Perlovsky, USA
Kent Davey, USA
David Landgrebe, USA
Steven H. Collicott, USA
Marco Ceccarelli, ITALY
John W. Lund, USA
Dimitris Bertsekas, USA
David Staelin, USA
A. Bers, MUSA
Leon Trilling, USA
Lotfi Zadeh, USA
Leon Chua, USA
Brian A. Barsky, USA
Leonid Kazovsky, USA
Rao Kamisetty, USA
Stamatios Kartalopoulos, USA

Preface

This year the 9th WSEAS International Conference on DATA NETWORKS, COMMUNICATIONS, COMPUTERS (DNCOCO '10) was held at the University of Algarve, Faro, Portugal, November 3-5, 2010. The conference remains faithful to its original idea of providing a platform to discuss network architecture, network design, synchronous networks, mobile networks and mobile services, peer to peer communication protocols, data engineering, knowledge engineering information security, risk analysis, anonymity techniques, software maintenance, intellectual property, wireless communications, microwave theory and techniques, microwave propagation, electromagnetic compatibility problems, applied electromagnetics, aerospace systems, video systems, programming languages, high performance languages, operating systems, hardware engineering, digital speech processing, computer networks, microelectronics, mobile computing, artificial intelligence, modelling and simulation, law aspects related to informatics etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

Table of Contents

Plenary Lecture 1: Large-Scale Ambient Intelligence	12
<i>Peter Mikulecky</i>	
Plenary Lecture 2: How to Model Software Generator for Information System in Order to Support Normative Organizational Activities	13
<i>Dzenana Donko</i>	
CryptoNET: Security Management Protocols	15
<i>Abdul Ghafoor Abbasi, Sead Muftic</i>	
Testing of a Microwave Transmission Link System at 2.45 GHz	21
<i>L. Ekonomou, V. Vita, G. E. Chatzarakis</i>	
On the Dynamic Decode-and-Forward Relay Listen-Transmit Decision Rule in Intersymbol Interference Channels	26
<i>Stefan Maagh, Mohammad Y. Sharif, A. E. A. Almaini</i>	
Gender Influence in Perception and Adoption of e-Learning Platforms	30
<i>Jorge Arenas-Gaitan, F. Javier Rondan-Cataluna, Patricio E. Ramirez-Correa</i>	
Communication Security for SCADA in Smart Grid Environment	36
<i>Rosslin John Robles, Tai-Hoon Kim</i>	
A Gradual Data Acquisition Replacement Strategy for the Laguna Verde Nuclear Power Plant	41
<i>Ramon Montellano-Garcia, Ilse Leal-Aulenbacher, Hector M. Bernal</i>	
On a Method for Describing System Management Operations and its Use in Evaluating Energy Saving Operations	47
<i>Matsuki Yoshino, Norihisa Komoda, Michiko Oba</i>	
Automated Risk Assessment: A Hierarchical Temporal Memory Approach	53
<i>Ricardo J. Rodriguez, James A. Cannady</i>	
Isolation Solution for Insecure Information Systems	58
<i>Maricel Balitanas, Tai-Hoon Kim</i>	
Specific Modeling of the Business Processes	62
<i>Dzenana Donko, Sead Sabeta</i>	
Frameworks for Model-Driven Development of Web Applications	67
<i>Vensada Okanovic, Dzenana Donko, Tadej Mateljan</i>	
Building Robust Web-Based Systems by Managing Exceptions through Logging, Reporting and Analysis	73
<i>Sharil Tumin, Sylvia Encheva</i>	

A New Approach in Fractal Image Compression Based on Honey Bee Mating Optimization and Quadtree	79
<i>Elham Afarandeh, Mahdi Yaghoobi</i>	
Categorization of Semantic Web Applications – The Basis for Defining Semantic Web Application Development Process	85
<i>Lidia Rován, Tomislav Jagust, Mirta Baranovic</i>	
Compensating the Nonlinearity of Laser Diode in Optical Wireless Transmission Using OFDM	92
<i>Haleh Karkhaneh, S. Mohammad Hassan Javadzadeh, Abubakar Sadiq Hussaini, Ayaz Ghorbani, Jonathan Rodriguez</i>	
Comparison of Digital Libraries Systems	97
<i>Michal Kokorcený, Agata Bodnarova</i>	
Using Social Network Services as an Input for a Trust Clustered - Collaborative Filtering Recommendation System	101
<i>Teo Eterovic, Benjamin Kapetanovic, Dzenana Donko</i>	
Multicriterial Decision Making in Multiagent Systems – Limitations and Advantages of State Representation of Behavior	105
<i>Petr Tucník</i>	
Initial Testing and Assessment of the First Share.TEC Repository System	111
<i>Dimo Boyadzhiev</i>	
Application of Quick Response (QR) Codes in Mobile Tagging System for Retrieving Information about Genetically Modified Food	114
<i>Tan Shiang Yen, Long Yoon Foo, Rosnah Idrus</i>	
E-model Improvement for Speech Quality Evaluation Including Codecs Tandeming	119
<i>Miroslav Voznak, Martin Tomes, Zuzana Vaclavikova, Michal Halas</i>	
SIP Threats Detection System	125
<i>Miroslav Voznak, Filip Rezac</i>	
Possibilities for Formal Models of Smart Environments	131
<i>Peter Mikulecky</i>	
Ambient Intelligence and Knowledge Management: Perspectives from the Czech Reality	137
<i>Richard Brunet-Thornton, Vladimir Bures</i>	
User Acceptance of the Microsoft Ribbon User Interface	143
<i>Martin Dostal</i>	
Managing NetLogo Models in CLIPS	150
<i>Kamila Olševicová, Agata Bodnarova, Pavel Cech</i>	
Information Systems in Healthcare: Potential of Mobile Systems. The Case of INEM	153
<i>Silvia Fernandes, Vitor Vieira</i>	
Process Analysis as an Optimization Support in Public Administration	157
<i>Pavel Vlcek</i>	

Six Sigma Methodology with Fraud Detection	162
<i>Andrej Trnka</i>	
Feasibility Analysis upon the Implementation of GSM Based Data Transfer Systems in Precision Agriculture	166
<i>Ciprian Pirna, Simona Lache</i>	
Authors Index	170

Plenary Lecture 1

Large-Scale Ambient Intelligence



Professor Peter Mikulecky
Department of Information Technologies
Faculty of Informatics and Management
University of Hradec Kralove
Rokitanskeho 62, Hradec Kralove
Czech Republic
E-mail: peter.mikulecky@uhk.cz

Abstract: According to a common understanding, Ambient Intelligence (Aml) aims to make digital devices so embedded and natural that we use them without even thinking about them. This emergence has been naturally paved by the research and technological advances in wireless sensor networks, embedded systems, mobile computing, distributed computing and communication. There is a number of recent applications, mostly intended for upgrading the intelligence of interior – intelligent homes, health care in hospitals or houses for elderly, intelligent classrooms, offices. However, it is also possible to think about large-scale ambient intelligence implementations, going outside the homes, outside internal spaces, into the environment, beyond the geographically restricted scenarios.

The notion large-scale ambient intelligence was used already in such a sense, where the users are able to acquire whatever, whenever and wherever. This would realistically allow to be truly mobile and allow the resources to be truly distributed (and thus ambient), rather than carrying out intelligent gadgets along with users. That is, in addition to incorporating intelligence in sensor nodes within a sensor network, the idea of large-scale ambient intelligence proposes to take this vision to the next level where these geographically distributed intelligent sensor networks become intelligent sensor resources that are accessible to the users anytime-anywhere.

In our talk we wish to bring an overview of recent activities and research in the area of large-scale ambient intelligence, including also some ideas about possible applications, namely in various environmentally sensitive cases. As an example we shall mention possible applications for such areas as water management, forests management, or disaster prevention. A number of recent approaches and a couple of recent interesting results in this challenging area will be presented as well.

Brief Biography of the Speaker: Prof. Dr. Peter Mikulecky is a professor of Managerial Informatics at the Faculty of Informatics and Management at the University of Hradec Kralove, Czech Republic, since 1993. He have been the head of the Department of Information Technologies since 1994, recently he acts also as Director for Research and Director of Postgraduate Studies at the same faculty. In the period of 1990 to 1993 he was the head of Department of Artificial Intelligence, Faculty of Mathematics and Physics at the Comenius University in Bratislava, Slovakia, where he worked in various positions since 1973. Recently he is also a member of the Accreditation Commission of the Government of Slovak Republic (since 2004) responsible for accreditations of Slovak higher educational institutions. Research of Professor Mikulecky covers ambient intelligence, artificial intelligence, knowledge-based systems and technologies, knowledge management, as well as human – computer interaction. He has published more than 150 papers in various journals and conference proceedings in these areas, as well as a number of books and book chapters. He was one of the founders of a regular series of events called Ambient Intelligence Forum; he is also a member of programme committees for a number of international conferences. Professor Mikulecky is also a member of a number of scientific societies and scientific boards.

Plenary Lecture 2

How to Model Software Generator for Information System in Order to Support Normative Organizational Activities



Professor Dzenana Donko
University of Sarajevo
Bosnia and Herzegovina
E-mail: ddonko@etf.unsa.ba

Abstract: This session will describe concept of normatively regulated activities and their basic concept. Normatively regulated activities are characterized by precise objective or purpose, participation of actors as role-holders, and norms and rules that govern the performance of these activities. They are typically found in insurance companies, banks, courts and many public administrations. In order to perform normatively regulated activities efficiently and effectively, actors need proper information and documents, but also have to act in accordance with relevant norms and rules. The performance of activities in accordance with norms and rules makes them normatively or legally correct and vice versa. Therefore, computerized support for this class of activities should also include, besides information processing and dissemination, support for taking actions in accord with applicable norms and rules. The main goal of the software systems in support of normatively regulated activities is increased efficiency and effectiveness, but also increased consistency in interpretation and application of norms and rules, and thus increased legitimacy of their performance. Aspects of the normatively regulated organizational activities and approach to make model of normatively regulated activities, which are bases for building software systems to support their performance, are also described. Some aspects of object view on normatively regulated activities will be described, with particular case of procurement activity and IT service management.

Brief Biography of the Speaker: Dzenana Donko received M.Sc. degree in Computer Science from the University of Sarajevo, BiH at the Faculty of Electrical Engineering in 1994 and Ph.D. degree in Computer Science at the same University in 2004. She is currently an associated professor at the University of Sarajevo where she teaches various subjects on computer science. Besides being an author and co-author of numerous papers with special aspect of business intelligence and published book "Object Oriented Analysis and Design", she is also member of the organizing committee and review of several international conferences. She was consultant on several projects for United Nations Development Project for digital government processes. Her research interest includes object oriented analysis and design, programming languages, web architectures and web programming, workflow management, system analysis and design, and service management.

Authors Index

Abbasi, A. G.	15	Lache, S.	166
Afarandeh, E.	79	Leal-Aulenbacher, I.	41
Almaini, A. E. A.	26	Maagh, S.	26
Arenas-Gaitan, J.	30	Mateljan, T.	67
Balitanas, M.	58	Mikulecky, P.	131
Baranovic, M.	85	Montellano-Garcia, R.	41
Bernal, H. M.	41	Muftic, S.	15
Bodnarova, A.	97, 150	Oba, M.	47
Boyadzhiev, D.	111	Okanovic, V.	67
Brunet-Thornton, R.	137	Olsevicova, K.	150
Bures, V.	137	Pirna, C.	166
Cannady, J. A.	53	Ramirez-Correa, P. E.	30
Cech, P.	150	Rezac, F.	125
Chatzarakis, G. E.	21	Robles, R. J.	36
Donko, D.	62, 67, 101	Rodriguez, J.	92
Dostal, M.	143	Rodriguez, R. J.	53
Ekonomou, L.	21	Rondan-Cataluna, F. J.	30
Encheva, S.	73	Rovan, L.	85
Eterovic, T.	101	Sabeta, S.	62
Fernandes, S.	153	Sharif, M. Y.	26
Foo, L. Y.	114	Tomes, M.	119
Ghorbani, A.	92	Trnka, A.	162
Halas, M.	119	Tucnik, P.	105
Hussaini, A. S.	92	Tumin, S.	73
Idrus, R.	114	Vaclavikova, Z.	119
Jagust, T.	85	Vieira, V.	153
Javadzadeh, S. M. H.	92	Vita, V.	21
Kapetanovic, B.	101	Vlcek, P.	157
Karkhaneh, H.	92	Voznak, M.	119, 125
Kim, T.-H.	36, 58	Yaghoobi, M.	79
Kokorceny, M.	97	Yen, T. S.	114
Komoda, N.	47	Yoshino, M.	47