

*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*

Beniamino Murgante Osvaldo Gervasi  
Sanjay Misra Nadia Nedjah  
Ana Maria A.C. Rocha David Taniar  
Bernady O. Apduhan (Eds.)

# Computational Science and Its Applications – ICCSA 2012

12th International Conference  
Salvador de Bahia, Brazil, June 18-21, 2012  
Proceedings, Part I

**Volume Editors**

**Beniamino Murgante**

University of Basilicata, Potenza, Italy, E-mail: beniamino.murgante@unibas.it

**Osvaldo Gervasi**

University of Perugia, Italy, E-mail: osvaldo@unipg.it

**Sanjay Misra**

Federal University of Technology, Minna, Nigeria, E-mail: smisra@futminna.edu.ng

**Nadia Nedjah**

State University of Rio de Janeiro, Brazil, E-mail: nadia@eng.uerj.br

**Ana Maria A. C. Rocha**

University of Minho, Braga, Portugal, E-mail: arocha@dps.uminho.pt

**David Taniar**

Monash University, Clayton, VIC, Australia, E-mail: david.taniar@infotech.monash.edu.au

**Bernady O. Apduhan**

Kyushu Sangyo University, Fukuoka, Japan, E-mail: bob@is.kyusan-u.ac.jp

ISSN 0302-9743

e-ISSN 1611-3349

ISBN 978-3-642-31124-6

e-ISBN 978-3-642-31125-3

DOI 10.1007/978-3-642-31125-3

Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2012939389

CR Subject Classification (1998): C.2.4, C.2, H.4, F.2, H.3, D.2, F.1, H.5, H.2.8, K.6.5, I.3

**LNCS Sublibrary: SL 1 – Theoretical Computer Science and General Issues**

© 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.

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](http://www.springer.com))

# Preface

This four-part volume (LNCS 7333-7336) contains a collection of research papers from the 12th International Conference on Computational Science and Its Applications (ICCSA 2012) held in Salvador de Bahia, Brazil, during June 18–21, 2012. ICCSA is one of the successful international conferences in the field of computational sciences, and this year for the first time in the history of the ICCSA conference series it was held in South America. Previously the ICCSA conference series have been held in Santander, Spain (2011), Fukuoka, Japan (2010), Suwon, Korea (2009), Perugia, Italy (2008), Kuala Lumpur, Malaysia (2007), Glasgow, UK (2006), Singapore (2005), Assisi, Italy (2004), Montreal, Canada (2003), (as ICCS) Amsterdam, The Netherlands (2002), and San Francisco, USA (2001).

The computational science community has enthusiastically embraced the successive editions of ICCSA, thus contributing to making ICCSA a focal meeting point for those interested in innovative, cutting-edge research about the latest and most exciting developments in the field. We are grateful to all those who have contributed to the ICCSA conference series.

ICCSA 2012 would not have been made possible without the valuable contribution of many people. We would like to thank all session organizers for their diligent work, which further enhanced the conference level, and all reviewers for their expertise and generous effort, which led to a very high quality event with excellent papers and presentations. We specially recognize the contribution of the Program Committee and local Organizing Committee members for their tremendous support and for making this congress a very successful event. We would like to sincerely thank our keynote speakers, who willingly accepted our invitation and shared their expertise.

We also thank our publisher, Springer, for accepting to publish the proceedings and for their kind assistance and cooperation during the editing process.

Finally, we thank all authors for their submissions and all conference attendees for making ICCSA 2012 truly an excellent forum on computational science, facilitating the exchange of ideas, fostering new collaborations and shaping the future of this exciting field. Last, but certainly not least, we wish to thank our readers for their interest in this volume. We really hope you find in these pages interesting material and fruitful ideas for your future work.

We cordially invite you to visit the ICCSA website—<http://www.iccsa.org>—where you can find relevant information about this interesting and exciting event.

June 2012

Osvaldo Gervasi  
David Taniar

# **Organization**

ICCSA 2012 was organized by Universidade Federal da Bahia (Brazil), Universidade Federal do Recôncavo da Bahia (Brazil), Universidade Estadual de Feira de Santana (Brazil), University of Perugia (Italy), University of Basilicata (Italy), Monash University (Australia), and Kyushu Sangyo University (Japan).

## **Honorary General Chairs**

Antonio Laganà	University of Perugia, Italy
Norio Shiratori	Tohoku University, Japan
Kenneth C.J. Tan	Qontix, UK

## **General Chairs**

Osvaldo Gervasi	University of Perugia, Italy
David Taniar	Monash University, Australia

## **Program Committee Chairs**

Bernady O. Apduhan	Kyushu Sangyo University, Japan
Beniamino Murgante	University of Basilicata, Italy

## **Workshop and Session Organizing Chairs**

Beniamino Murgante	University of Basilicata, Italy
--------------------	---------------------------------

## **Local Organizing Committee**

Frederico V. Prudente	Universidade Federal da Bahia, Brazil (Chair)
Mirco Ragni	Universidade Estadual de Feira de Santana, Brazil
Ana Carla P. Bitencourt	Universidade Federal do Recôncavo da Bahia, Brazil
Cassio Pigozzo	Universidade Federal da Bahia, Brazil
Angelo Duardo	Universidade Estadual de Feira de Santana, Brazil
Marcos E. Barreto	Universidade Federal da Bahia, Brazil
José Garcia V. Miranda	Universidade Federal da Bahia, Brazil

## International Liaison Chairs

Jemal Abawajy	Deakin University, Australia
Marina L. Gavrilova	University of Calgary, Canada
Robert C.H. Hsu	Chung Hua University, Taiwan
Tai-Hoon Kim	Hannam University, Korea
Andrés Iglesias	University of Cantabria, Spain
Takashi Naka	Kyushu Sangyo University, Japan
Rafael D.C. Santos	National Institute for Space Research, Brazil

## Workshop Organizers

### Advances in High-Performance Algorithms and Applications (AHPAA 2012)

Massimo Cafaro	University of Salento, Italy
Giovanni Aloisio	University of Salento, Italy

### Advances in Web-Based Learning (AWBL 2012)

Mustafa Murat Inceoglu	Ege University, Turkey
------------------------	------------------------

### Bio-inspired Computing and Applications (BIOCA 2012)

Nadia Nedjah	State University of Rio de Janeiro, Brazil
Luiza de Macedo Mourelle	State University of Rio de Janeiro, Brazil

### Computer-Aided Modeling, Simulation, and Analysis (CAMSA 2012)

Jie Shen	University of Michigan, USA
Yuqing Song	Tianjin University of Technology and Education, China

### Cloud Computing and Its Applications (CCA 2012)

Jemal Abawajy	University of Deakin, Australia
Osvaldo Gervasi	University of Perugia, Italy

### Computational Geometry and Applications (CGA 2012)

Marina L. Gavrilova	University of Calgary, Canada
---------------------	-------------------------------

**Chemistry and Materials Sciences and Technologies  
(CMST 2012)**

Antonio Laganà

University of Perugia, Italy

**Cities, Technologies and Planning (CTP 2012)**

Giuseppe Borruso

University of Trieste, Italy

Beniamino Murgante

University of Basilicata, Italy

**Computational Tools and Techniques for Citizen Science  
and Scientific Outreach (CTTCS 2012)**

Rafael Santos

National Institute for Space Research, Brazil

Jordan Raddick and

Johns Hopkins University, USA

Ani Thakar

Johns Hopkins University, USA

**Econometrics and Multidimensional Evaluation in the  
Urban Environment (EMEUE 2012)**

Carmelo M. Torre

Polytechnic of Bari, Italy

Maria Cerreta

Università Federico II of Naples, Italy

Paola Perchinunno

University of Bari, Italy

**Future Information System Technologies and Applications  
(FISTA 2012)**

Bernady O. Apduhan

Kyushu Sangyo University, Japan

**Geographical Analysis, Urban Modeling, Spatial Statistics  
(GEOG-AN-MOD 2012)**

Stefania Bertazzon

University of Calgary, Canada

Giuseppe Borruso

University of Trieste, Italy

Beniamino Murgante

University of Basilicata, Italy

**International Workshop on Biomathematics,  
Bioinformatics and Biostatistics (IBBB 2012)**

Unal Ufuktepe

Izmir University of Economics, Turkey

Andrés Iglesias

University of Cantabria, Spain

## **International Workshop on Collective Evolutionary Systems (IWCES 2012)**

Alfredo Milani  
Clement Leung

University of Perugia, Italy  
Hong Kong Baptist University, Hong Kong

## **Mobile Communications (MC 2012)**

Hyunseung Choo

Sungkyunkwan University, Korea

## **Mobile Computing, Sensing, and Actuation for Cyber Physical Systems (MSA4CPS 2012)**

Moonseong Kim  
Saad Qaisar

Korean intellectual Property Office, Korea  
NUST School of Electrical Engineering and  
Computer Science, Pakistan

## **Optimization Techniques and Applications (OTA 2012)**

Ana Maria Rocha

University of Minho, Portugal

## **Parallel and Mobile Computing in Future Networks (PMCFUN 2012)**

Al-Sakib Khan Pathan

International Islamic University Malaysia,  
Malaysia

## **PULSES - Transitions and Nonlinear Phenomena (PULSES 2012)**

Carlo Cattani  
Ming Li  
Shengyong Chen

University of Salerno, Italy  
East China Normal University, China  
Zhejiang University of Technology, China

## **Quantum Mechanics: Computational Strategies and Applications (QMCSA 2012)**

Mirco Ragni  
Frederico Vasconcellos  
Prudente  
Angelo Marconi Maniero  
Ana Carla Peixoto Bitencourt

Universidad Federal de Bahia, Brazil  
Universidad Federal de Bahia, Brazil  
Universidad Federal de Bahia, Brazil  
Universidade Federal do Recôncavo da Bahia,  
Brazil

## **Remote Sensing Data Analysis, Modeling, Interpretation and Applications: From a Global View to a Local Analysis (RS 2012)**

Rosa Lasaponara

Institute of Methodologies for Environmental Analysis, National Research Council, Italy  
Archaeological and Monumental Heritage Institute, National Research Council, Italy

Nicola Masini

## **Soft Computing and Data Engineering (SCDE 2012)**

Mustafa Matt Deris  
Tutut Herawan

Universiti Tun Hussein Onn Malaysia, Malaysia  
Universitas Ahmad Dahlan, Indonesia

## **Software Engineering Processes and Applications (SEPA 2012)**

Sanjay Misra

Federal University of Technology Minna,  
Nigeria

## **Software Quality (SQ 2012)**

Sanjay Misra

Federal University of Technology Minna,  
Nigeria

## **Security and Privacy in Computational Sciences (SPCS 2012)**

Arijit Ukil

Tata Consultancy Services, India

## **Tools and Techniques in Software Development Processes (TTSDP 2012)**

Sanjay Misra

Federal University of Technology Minna,  
Nigeria

## **Virtual Reality and Its Applications (VRA 2012)**

Osvaldo Gervasi  
Andrés Iglesias

University of Perugia, Italy  
University of Cantabria, Spain

## Wireless and Ad-Hoc Networking (WADNet 2012)

Jongchan Lee  
Sangjoon Park

Kunsan National University, Korea  
Kunsan National University, Korea

### Program Committee

Jemal Abawajy	Daekin University, Australia
Kenny Adamson	University of Ulster, UK
Filipe Alvelos	University of Minho, Portugal
Paula Amaral	Universidade Nova de Lisboa, Portugal
Hartmut Asche	University of Potsdam, Germany
Md. Abul Kalam Azad	University of Minho, Portugal
Michela Bertolotto	University College Dublin, Ireland
Sandro Bimonte	CEMAGREF, TSCF, France
Rod Blais	University of Calgary, Canada
Ivan Blecic	University of Sassari, Italy
Giuseppe Borruso	University of Trieste, Italy
Alfredo Buttari	CNRS-IRIT, France
Yves Caniou	Lyon University, France
José A. Cardoso e Cunha	Universidade Nova de Lisboa, Portugal
Leocadio G. Casado	University of Almeria, Spain
Carlo Cattani	University of Salerno, Italy
Mete Celik	Erciyes University, Turkey
Alexander Chemeris	National Technical University of Ukraine “KPI”, Ukraine
Min Young Chung	Sungkyunkwan University, Korea
Gilberto Corso Pereira	Federal University of Bahia, Brazil
M. Fernanda Costa	University of Minho, Portugal
Gaspar Cunha	University of Minho, Portugal
Carla Dal Sasso Freitas	Universidade Federal do Rio Grande do Sul, Brazil
Pradesh Debbá	The Council for Scientific and Industrial Research (CSIR), South Africa
Frank Devai	London South Bank University, UK
Rodolphe Devillers	Memorial University of Newfoundland, Canada
Prabu Dorairaj	NetApp, India/USA
M. Irene Falcao	University of Minho, Portugal
Cherry Liu Fang	U.S. DOE Ames Laboratory, USA
Edite M.G.P. Fernandes	University of Minho, Portugal
Jose-Jesus Fernandez	National Centre for Biotechnology, CSIS, Spain
Maria Antonia Forjaz	University of Minho, Portugal
Maria Celia Furtado Rocha	PRODEB-PósCultura/UFBA, Brazil
Akemi Galvez	University of Cantabria, Spain
Paulino Jose Garcia Nieto	University of Oviedo, Spain
Marina Gavrilova	University of Calgary, Canada

Jerome Gensel	LSR-IMAG, France
Maria Giaoutzi	National Technical University, Athens, Greece
Andrzej M. Goscinski	Deakin University, Australia
Alex Hagen-Zanker	University of Cambridge, UK
Malgorzata Hanzl	Technical University of Lodz, Poland
Shanmugasundaram	
Hariharan	
Eligius M.T. Hendrix	
Hisamoto Hiyoshi	B.S. Abdur Rahman University, India
Fermin Huarte	University of Malaga/Wageningen University, Spain/The Netherlands
Andres Iglesias	Gunma University, Japan
Mustafa Inceoglu	University of Barcelona, Spain
Peter Jimack	University of Cantabria, Spain
Qun Jin	EGE University, Turkey
Farid Karimipour	University of Leeds, UK
Baris Kazar	Waseda University, Japan
DongSeong Kim	Vienna University of Technology, Austria
Taihoon Kim	Oracle Corp., USA
Ivana Kolingerova	University of Canterbury, New Zealand
Dieter Kranzlmueller	Hannam University, Korea
Antonio Laganà	University of West Bohemia, Czech Republic
Rosa Lasaponara	LMU and LRZ Munich, Germany
Maurizio Lazzari	University of Perugia, Italy
Cheng Siong Lee	National Research Council, Italy
Sangyoun Lee	National Research Council, Italy
Jongchan Lee	Monash University, Australia
Clement Leung	Yonsei University, Korea
Chendong Li	Kunsan National University, Korea
Gang Li	Hong Kong Baptist University, Hong Kong
Ming Li	University of Connecticut, USA
Fang Liu	Deakin University, Australia
Xin Liu	East China Normal University, China
Savino Longo	AMES Laboratories, USA
Tinghuai Ma	University of Calgary, Canada
Sergio Maffioletti	University of Bari, Italy
Ernesto Marcheggiani	NanJing University of Information Science and Technology, China
Antonino Marvuglia	University of Zurich, Switzerland
Nicola Masini	Katholieke Universiteit Leuven, Belgium
Nirvana Meratnia	Research Centre Henri Tudor, Luxembourg
Alfredo Milani	National Research Council, Italy
Sanjay Misra	University of Twente, The Netherlands
Giuseppe Modica	University of Perugia, Italy
	Federal University of Technology Minna, Nigeria
	University of Reggio Calabria, Italy

José Luis Montaña	University of Cantabria, Spain
Beniamino Murgante	University of Basilicata, Italy
Jiri Nedoma	Academy of Sciences of the Czech Republic, Czech Republic
Laszlo Neumann	University of Girona, Spain
Kok-Leong Ong	Deakin University, Australia
Belen Palop	Universidad de Valladolid, Spain
Marcin Paprzycki	Polish Academy of Sciences, Poland
Eric Paredede	La Trobe University, Australia
Kwangjin Park	Wonkwang University, Korea
Ana Isabel Pereira	Polytechnic Institute of Braganca, Portugal
Maurizio Pollino	Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Italy
Alenka Poplin	University of Hamburg, Germany
Vidyasagar Potdar	Curtin University of Technology, Australia
David C. Prospieri	Florida Atlantic University, USA
Wenny Rahayu	La Trobe University, Australia
Jerzy Respondek	Silesian University of Technology Poland
Ana Maria A.C. Rocha	University of Minho, Portugal
Humberto Rocha	INESC-Coimbra, Portugal
Alexey Rodionov	Institute of Computational Mathematics and Mathematical Geophysics, Russia
Cristina S. Rodrigues	University of Minho, Portugal
Octavio Roncero	CSIC, Spain
Maytham Safar	Kuwait University, Kuwait
Haiduke Sarafian	The Pennsylvania State University, USA
Qi Shi	Liverpool John Moores University, UK
Dale Shires	U.S. Army Research Laboratory, USA
Takuo Suganuma	Tohoku University, Japan
Ana Paula Teixeira	University of Tras-os-Montes and Alto Douro, Portugal
Senhorinha Teixeira	University of Minho, Portugal
Parimala Thulasiraman	University of Manitoba, Canada
Carmelo Torre	Polytechnic of Bari, Italy
Javier Martinez Torres	Centro Universitario de la Defensa Zaragoza, Spain
Giuseppe A. Trunfio	University of Sassari, Italy
Unal Ufuktepe	Izmir University of Economics, Turkey
Mario Valle	Swiss National Supercomputing Centre, Switzerland
Pablo Vanegas	University of Cuenca, Ecuador
Piero Giorgio Verdini	INFN Pisa and CERN, Italy
Marco Vizzari	University of Perugia, Italy
Koichi Wada	University of Tsukuba, Japan

Krzysztof Walkowiak  
 Robert Weibel  
 Roland Wismüller  
 Mudasser Wyne  
 Chung-Huang Yang  
 Xin-She Yang  
 Salim Zabir  
 Albert Y. Zomaya

Wroclaw University of Technology, Poland  
 University of Zurich, Switzerland  
 Universität Siegen, Germany  
 SOET National University, USA  
 National Kaohsiung Normal University, Taiwan  
 National Physical Laboratory, UK  
 France Telecom Japan Co., Japan  
 University of Sydney, Australia

## Sponsoring Organizations

ICCSA 2012 would not have been possible without tremendous support of many organizations and institutions, for which all organizers and participants of ICCSA 2012 express their sincere gratitude:



Universidade Federal da Bahia, Brazil  
 (<http://www.ufba.br>)



Universidade Federal do Recôncavo da Bahia,  
 Brazil  
 (<http://www.ufrb.edu.br>)



Universidade Estadual de Feira de Santana,  
 Brazil  
 (<http://www.uefs.br>)



University of Perugia, Italy  
 (<http://www.unipg.it>)



University of Basilicata, Italy  
 (<http://www.unibas.it>)



MONASH University

Monash University, Australia  
(<http://monash.edu>)



Kyushu Sangyo University, Japan  
([www.kyusan-u.ac.jp](http://www.kyusan-u.ac.jp))



Brazilian Computer Society  
([www.sbc.org.br](http://www.sbc.org.br))



Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Brazil  
(<http://www.capes.gov.br>)



National Council for Scientific and Technological Development (CNPq), Brazil  
(<http://www.cnpq.br>)



SECRETARIA DE CIÊNCIA,  
TECNOLOGIA E INovaÇÃO



Fundaçao de Amparo à Pesquisa do Estado da Bahia (FAPESB), Brazil  
(<http://www.fapesb.ba.gov.br>)

# Table of Contents – Part I

## Workshop on Advances in High Performance Algorithms and Applications (AHPAA 2012)

Processor Allocation for Optimistic Parallelization of Irregular Programs .....	1
<i>Francesco Versaci and Keshav Pingali</i>	
Feedback-Based Global Instruction Scheduling for GPGPU Applications.....	15
<i>Constantin Timm, Markus Görlich, Frank Weichert, Peter Marwedel, and Heinrich Müller</i>	
Parallel Algorithm for Landform Attributes Representation on Multicore and Multi-GPU Systems .....	29
<i>Murilo Boratto, Pedro Alonso, Carla Ramiro, Marcos Barreto, and Leandro Coelho</i>	
The Performance Model of an Enhanced Parallel Algorithm for the SOR Method .....	44
<i>Italo Epicoco and Silvia Mocavero</i>	
Performance Driven Cooperation between Kernel and Auto-tuning Multi-threaded Interval B&B Applications .....	57
<i>Juan Francisco Sanjuan-Estrada, Leocadio Gonzalez Casado, Immaculada García, and Eligius M.T. Hendrix</i>	
$k$ NN-Borůvka-GPU: A Fast and Scalable MST Construction from $k$ NN Graphs on GPU .....	71
<i>Ahmed Shamsul Arefin, Carlos Riveros, Regina Berretta, and Pablo Moscato</i>	

## Workshop on Bio-inspired Computing and Applications (BIOCA 2012)

Global Hybrid Ant Bee Colony Algorithm for Training Artificial Neural Networks .....	87
<i>Habib Shah, Rozaida Ghazali, Nazri Mohd Nawi, and Mustafa Mat Deris</i>	
The Effect of Intelligent Escape on Distributed SER-Based Search.....	101
<i>Daniel S.F. Alves, Felipe M.G. França, Luiza de Macedo Mourelle, Nadia Nedjah, and Priscila M.V. Lima</i>	

ACO-Based Static Routing for Network-on-Chips .....	113
<i>Luneque Silva Jr., Nadia Nedjah, Luiza de Macedo Mourelle, and Fábio Gonçalves Pessanha</i>	
A Genetic Algorithm Assisted by a Locally Weighted Regression Surrogate Model .....	125
<i>Leonardo G. Fonseca, Heder S. Bernardino, and Helio J.C. Barbosa</i>	
Swarm Robots with Queue Organization Using Infrared Communication .....	136
<i>Rafael Mathias de Mendonça, Nadia Nedjah, and Luiza de Macedo Mourelle</i>	
Swarm Grid: A Proposal for High Performance of Parallel Particle Swarm Optimization Using GPGPU .....	148
<i>Rogério M. Calazan, Nadia Nedjah, and Luiza de Macedo Mourelle</i>	
An Artificial Immune System Approach to Associative Classification....	161
<i>Samir A. Mohamed Elsayed, Sanguthevar Rajasekaran, and Reda A. Ammar</i>	

## **Workshop on Computational Geometry and Applications (CGA 2012)**

A Review on Delaunay Refinement Techniques .....	172
<i>Sanderson L. Gonzaga de Oliveira</i>	
Axis-Parallel Dimension Reduction for Biometric Research .....	188
<i>Kushan Ahmadian and Marina Gavrilova</i>	
An Overview of Procedures for Refining Triangulations .....	198
<i>Sanderson L. Gonzaga de Oliveira</i>	
DEM Interpolation from Contours Using Medial Axis Transformation .....	214
<i>Joonsoo Choi, Jaewee Heo, Kwang-Soo Hahn, and Junho Kim</i>	
Analysis of a High Definition Camera-Projector Video System for Geometry Reconstruction .....	228
<i>José Luiz de Souza Filho, Roger Correia Silva, Dhiego Oliveira Sad, Renan Dembogurski, Marcelo Bernardes Vieira, Sócrates de Oliveira Dantas, and Rodrigo Silva</i>	
Video-Based Face Verification with Local Binary Patterns and SVM Using GMM Supervectors .....	240
<i>Tiago F. Pereira, Marcus A. Angeloni, Flávio O. Simões, and José Eduardo C. Silva</i>	

GPU-Based Influence Regions Optimization . . . . .	253
<i>Marta Fort and J. Antoni Sellarès</i>	
Fast and Simple Approach for Polygon Schematization . . . . .	267
<i>Serafino Cicerone and Matteo Cermignani</i>	
On Counting and Analyzing Empty Pseudo-triangles in a Point Set . . . . .	280
<i>Sergey Kopeliovich and Kira Vyatkina</i>	
<b>Workshop on Chemistry and Materials Sciences and Technologies (CMST 2012)</b>	
Quantum Reactive Scattering Calculations on GPU . . . . .	292
<i>Leonardo Pacifici, Danilo Nalli, and Antonio Laganà</i>	
Tuning Heme Functionality: The Cases of Cytochrome <i>c</i> Oxidase and Myoglobin Oxidation . . . . .	304
<i>Vangelis Daskalakis, Stavros C. Farantos, and Constantinos Varotsis</i>	
Theoretical and Experimental Study of the Energy and Structure of Fragment Ions Produced by Double Photoionization of Benzene Molecules . . . . .	316
<i>Marzio Rosi, Pietro Candori, Stefano Falcinelli, Maria Suelly Pedrosa Mundim, Fernando Pirani, and Franco Vecchiocattivi</i>	
Theoretical Study of Reactions Relevant for Atmospheric Models of Titan: Interaction of Excited Nitrogen Atoms with Small Hydrocarbons . . . . .	331
<i>Marzio Rosi, Stefano Falcinelli, Nadia Balucani, Piergiorgio Casavecchia, Francesca Leonori, and Dimitris Skouteris</i>	
Efficient Workload Distribution Bridging HTC and HPC in Scientific Computing . . . . .	345
<i>Carlo Manzoli, Alessandro Costantini, Antonio Laganà, Marco Cecchi, Antonia Ghiselli, Michele Carpené, and Elda Rossi</i>	
Taxonomy Management in a Federation of Distributed Repositories: A Chemistry Use Case . . . . .	358
<i>Sergio Tasso, Simonetta Pallottelli, Michele Ferroni, Riccardo Bastianini, and Antonio Laganà</i>	
Grid Enabled High Level <i>ab initio</i> Electronic Structure Calculations for the N <sub>2</sub> +N <sub>2</sub> Exchange Reaction . . . . .	371
<i>Marco Verdicchio, Leonardo Pacifici, and Antonio Laganà</i>	

A Bond-Bond Portable Approach to Intermolecular Interactions: Simulations for N-methylacetamide and Carbon Dioxide Dimers .....	387
<i>Andrea Lombardi, Noelia Faginas Lago, Antonio Laganà, Fernando Pirani, and Stefano Falcinelli</i>	
A Grid Execution Model for Computational Chemistry Applications Using the GC3Pie Framework and the AppPot VM Environment.....	401
<i>Alessandro Costantini, Riccardo Murri, Sergio Maffioletti, and Antonio Laganà</i>	
The MPI Structure of Chimere .....	417
<i>Antonio Laganà, Stefano Crocchianti, Giorgio Tentella, and Alessandro Costantini</i>	
A New Statistical Method for the Determination of Dynamical Features of Molecular Dication Dissociation Processes .....	432
<i>Maria Suely Pedrosa Mundim, Pietro Candori, Stefano Falcinelli, Kleber Carlos Mundim, Fernando Pirani, and Franco Vecchiocattivi</i>	
<b>Workshop on Cities, Technologies and Planning (CTP 2012)</b>	
SWOT Analysis of Information Technology Industry in Beijing, China Using Patent Data .....	447
<i>Lucheng Huang, Kangkang Wang, Feifei Wu, Yan Lou, Hong Miao, and Yanmei Xu</i>	
Using 3D GeoDesign for Planning of New Electricity Networks in Spain .....	462
<i>Francisco-Javier Moren Marimbaldo, Federico-Vladimir Gutiérrez Corea, and Miguel-Ángel Manso Callejo</i>	
Assessment of Online PPGIS Study Cases in Urban Planning .....	477
<i>Geisa Bugs</i>	
e-Participation: Social Media and the Public Space .....	491
<i>Gilberto Corso Pereira, Maria Célia Furtado Rocha, and Alenka Poplin</i>	
Ubicomp and Environmental Designers: Assembling a Collective Work towards the Development of Sustainable Technologies .....	502
<i>Renato Cesar Ferreira de Souza</i>	
Sustainable Micro-business in Environmental Unsustainability and Economic Inefficiency .....	518
<i>José G. Vargas-Hernández</i>	

Efficient Visualization of the Geometric Information of CityGML: Application for the Documentation of Built Heritage .....	529
<i>Iñaki Prieto, Jose Luis Izkara, and Francisco Javier Delgado del Hoyo</i>	
ICT to Evaluate Participation in Urban Planning: Remarks from a Case Study.....	545
<i>Francesco Rotondo and Francesco Selicato</i>	
A Spatial Data Infrastructure Situation-Aware to the 2014 World Cup .....	561
<i>Wellington Moreira de Oliveira, Jugurta Lisboa Filho, and Alcione de Paiva Oliveira</i>	
Towards a Two-Way Participatory Process .....	571
<i>António Silva and Jorge Gustavo Rocha</i>	
An Automatic Procedure to Select Areas for Transfer Development Rights in the Urban Market .....	583
<i>Carmelo Maria Torre, Pasquale Balena, and Romina Zito</i>	
<b>General Track on Computational Methods, Algorithms and Scientific Application</b>	
Magnetic Net and a Bouncing Magnetic Ball .....	599
<i>Haiduke Sarafian</i>	
Autonomous Leaves Graph Applied to the Simulation of the Boundary Layer around a Non-symmetric NACA Airfoil .....	610
<i>Sanderson Lincoln Gonzaga de Oliveira and Mauricio Kischinhevsky</i>	
Sinimbu – Multimodal Queries to Support Biodiversity Studies .....	620
<i>Gabriel de S. Fedel, Claudia Bauzer Medeiros, and Jefersson Alex dos Santos</i>	
Comparison between Genetic Algorithms and Differential Evolution for Solving the History Matching Problem .....	635
<i>Elisa P. dos Santos Amorim, Carolina R. Xavier, Ricardo Silva Campos, and Rodrigo W. dos Santos</i>	
An Adaptive Mesh Algorithm for the Numerical Solution of Electrical Models of the Heart .....	649
<i>Rafael S. Oliveira, Bernardo M. Rocha, Denise Burgarelli, Wagner Meira Jr., and Rodrigo W. dos Santos</i>	
Decision Model to Predict the Implant Success.....	665
<i>Ana Cristina Braga, Paula Vaz, João C. Sampaio-Fernandes, António Felino, and Maria Purificação Tavares</i>	

Multiscale Modeling of Heterogeneous Media Applying AEH to 3D Bodies . . . . .	675
<i>Bárbara de Melo Quintela, Daniel Mendes Caldas, Michèle Cristina Resende Farage, and Marcelo Lobosco</i>	
A Three-Dimensional Computational Model of the Innate Immune System . . . . .	691
<i>Pedro Augusto F. Rocha, Micael P. Xavier, Alexandre B. Pigozzo, Barbara de M. Quintela, Gilson C. Macedo, Rodrigo Weber dos Santos, and Marcelo Lobosco</i>	
System Dynamics Metamodels Supporting the Development of Computational Models of the Human Innate Immune System . . . . .	707
<i>Igor Knop, Alexandre Pigozzo, Barbara Quintela, Gilson C. Macedo, Ciro Barbosa, Rodrigo Weber dos Santos, and Marcelo Lobosco</i>	
Exact and Asymptotic Computations of Elementary Spin Networks: Classification of the Quantum–Classical Boundaries . . . . .	723
<i>Ana Carla P. Bitencourt, Annalisa Marzuoli, Mirco Ragni, Roger W. Anderson, and Vincenzo Aquilanti</i>	
Performance of DFT and MP2 Approaches for Geometry of Rhenium Allenylidenes Complexes and the Thermodynamics of Phosphines Addition . . . . .	738
<i>Cecilia Coletti and Nazzareno Re</i>	
<b>Author Index . . . . .</b>	<b>753</b>

## Table of Contents – Part II

### Workshop on Econometrics and Multidimensional Evaluation in the Urban Environment (EMEUE 2012)

Knowledge and Innovation in Manufacturing Sector: The Case of Wedding Dresses in Southern Italy .....	1
<i>Annunziata de Felice, Isabella Martucci, and Dario A. Schirone</i>	
Marketing Strategies: Support and Enhancement of Core Business .....	17
<i>Dario Antonio Schirone and Germano Torkan</i>	
The Rational Quantification of Social Housing: An Operative Research Model .....	27
<i>Gianluigi De Mare, Antonio Nesticò, and Francesco Tajani</i>	
Simulation of Users Decision in Transport Mode Choice Using Neuro-Fuzzy Approach .....	44
<i>Mauro Dell'Orco and Michele Ottomanelli</i>	
Multidimensional Spatial Decision-Making Process: Local Shared Values in Action .....	54
<i>Maria Cerreta, Simona Panaro, and Daniele Cannatella</i>	
A Proposal for a Stepwise Fuzzy Regression: An Application to the Italian University System .....	71
<i>Francesco Campobasso and Annarita Fanizzi</i>	
Cluster Analysis for Strategic Management: A Case Study of IKEA .....	88
<i>Paola Perchinunno and Dario Antonio Schirone</i>	
Clustering for the Localization of Degraded Urban Areas .....	102
<i>Silvestro Montrone and Paola Perchinunno</i>	
A BEP Analysis of Energy Supply for Sustainable Urban Microgrids ...	116
<i>Pasquale Balena, Giovanna Mangialardi, and Carmelo Maria Torre</i>	
The Effect of Infrastructural Works on Urban Property Values: The <i>asse attrezzato</i> in Pescara, Italy .....	128
<i>Sebastiano Carbonara</i>	
Prospect of Integrate Monitoring: A Multidimensional Approach .....	144
<i>Marco Selicato, Carmelo Maria Torre, and Giovanni La Trofa</i>	

The Use of Ahp in a Multiactor Evaluation for Urban Development Programs: A Case Study .....	157
<i>Luigi Fusco Girard and Carmelo Maria Torre</i>	
Assessing Urban Transformations: A SDSS for the Master Plan of Castel Capuano, Naples.....	168
<i>Maria Cerreta and Pasquale De Toro</i>	
<b>Workshop on Geographical Analysis, Urban Modeling, Spatial Statistics (Geo-An-Mod 2012)</b>	
Computational Context to Promote Geographic Information Systems toward Human-Centric Perspectives .....	181
<i>Luis Paulo da Silva Carvalho and Paulo Caetano da Silva</i>	
Voronoi-Based Curve Reconstruction: Issues and Solutions .....	194
<i>Mehran Ghandehari and Farid Karimipour</i>	
Geovisualization and Geostatistics: A Concept for the Numerical and Visual Analysis of Geographic Mass Data .....	208
<i>Julia Gonschorek and Lucia Tyrallová</i>	
Spatio-Explorative Analysis and Its Benefits for a GIS-integrated Automated Feature Identification .....	220
<i>Lucia Tyrallová and Julia Gonschorek</i>	
Peer Selection in P2P Service Overlays Using Geographical Location Criteria .....	234
<i>Adriano Fiorese, Paulo Simões, and Fernando Boavida</i>	
Models for Spatial Interaction Data: Computation and Interpretation of Accessibility .....	249
<i>Morton E. O'Kelly</i>	
Am I Safe in My Home? Fear of Crime Analyzed with Spatial Statistics Methods in a Central European City .....	263
<i>Daniel Lederer</i>	
Developing a GIS Based Decision Support System for Resource Allocation in Earthquake Search and Rescue Operation .....	275
<i>Abolfazl Rasekh and Ali Reza Vafaeinezhad</i>	
Concepts, Compass and Computation: Models for Directional Part-Whole Relationships .....	286
<i>Gaurav Singh, Rolf A. de By, and Ivana Ivánová</i>	

SIGHabitar – Business Intelligence Based Approach for the Development of Land Information Systems: The Multipurpose Technical Cadastre of Ouro Preto, Brazil . . . . .	302
<i>João Tácio C. Silva, José Francisco V. Rezende, Érika Fidêncio, Tarick Melo, Brayan Neves, and Joubert C. Lima e Tiago G.S. Carneiro</i>	
Rehabilitation and Reconstruction of Asphalts Pavement Decision Making Based on Rough Set Theory . . . . .	316
<i>Shaaban M. Shaaban and Hossam A. Nabwey</i>	
Cartographic Circuits Inside GIS Environment for the Construction of the Landscape Sensitivity Map in the Case of Cremona . . . . .	331
<i>Pier Luigi Paolillo, Umberto Baresi, and Roberto Bisceglie</i>	
Cloud Classification in JPEG-compressed Remote Sensing Data (LANDSAT 7/ETM+) . . . . .	347
<i>Erik Borg, Bernd Fichtelmann, and Hartmut Asche</i>	
A Probabilistic Rough Set Approach for Water Reservoirs Site Location Decision Making . . . . .	358
<i>Shaaban M. Shaaban and Hossam A. Nabwey</i>	
Definition and Analysis of New Agricultural Farm Energetic Indicators Using Spatial OLAP . . . . .	373
<i>Sandro Bimonte, Kamal Boullil, Jean-Pierre Chanet, and Marilys Pradel</i>	
Validating a Smartphone-Based Pedestrian Navigation System Prototype: An Informal Eye-Tracking Pilot Test . . . . .	386
<i>Mario Kluge and Hartmut Asche</i>	
Open Access to Historical Atlas: Sources of Information and Services for Landscape Analysis in an SDI Framework . . . . .	397
<i>Raffaella Brumana, Daniela Oreni, Branka Cuca, Anna Rampini, and Monica Pepe</i>	
From Concept to Implementation: Web-Based Cartographic Visualisation with CartoService . . . . .	414
<i>Hartmut Asche and Rita Engemaier</i>	
Multiagent Systems for the Governance of Spatial Environments: Some Modelling Approaches . . . . .	425
<i>Domenico Camarda</i>	
A Data Fusion System for Spatial Data Mining, Analysis and Improvement . . . . .	439
<i>Silvija Stankute and Hartmut Asche</i>	

Dealing with Multiple Source Spatio-temporal Data in Urban Dynamics Analysis .....	450
<i>João Peixoto and Adriano Moreira</i>	
Public Decision Processes: The Interaction Space Supporting Planner’s Activity .....	466
<i>Giuseppe B. Las Casas, Lucia Tilio, and Alexis Tsoukias</i>	
Selection and Scheduling Problem in Continuous Time with Pairwise-Interdependencies .....	481
<i>Ivan Blecic, Arnaldo Cecchini, and Giuseppe A. Trunfio</i>	
Parallel Simulation of Urban Dynamics on the GPU .....	492
<i>Ivan Blecic, Arnaldo Cecchini, and Giuseppe A. Trunfio</i>	
Geolocalization as Wayfinding and User Experience Support in Cultural Heritage Locations .....	508
<i>Letizia Bollini and Roberto Falcone</i>	
Climate Alteration in the Metropolitan Area of Bari: Temperatures and Relationship with Characters of Urban Context .....	517
<i>Pierangela Loconte, Claudia Ceppi, Giorgia Lubisco, Francesco Mancini, Claudia Piscitelli, and Francesco Selicato</i>	
Study of Sustainability of Renewable Energy Sources through GIS Analysis Techniques .....	532
<i>Emanuela Caiaffa, Alessandro Marucci, and Maurizio Pollino</i>	
The Comparative Analysis of Urban Development in Two Geographic Regions: The State of Rio De Janeiro and the Campania Region .....	548
<i>Massimiliano Bencardino, Ilaria Greco, and Pitter Reis Ladeira</i>	
Land-Use Dynamics at the Micro Level: Constructing and Analyzing Historical Datasets for the Portuguese Census Tracts .....	565
<i>António M. Rodrigues, Teresa Santos, Raquel Faria de Deus, and Dulce Pimentel</i>	
Using Hydrodynamic Modeling for Estimating Flooding and Water Depths in Grand Bay, Alabama .....	578
<i>Vladimir J. Alarcon and William H. McAnally</i>	
Comparison of Two Hydrodynamic Models of Weeks Bay, Alabama .....	589
<i>Vladimir J. Alarcon, William H. McAnally, and Surendra Pathak</i>	
Connections between Urban Structure and Urban Heat Island Generation: An Analysis through Remote Sensing and GIS .....	599
<i>Marialuce Stanganelli and Marco Soravia</i>	

Taking the Leap: From Disparate Data to a Fully Interactive SEIS for the Maltese Islands .....	609
<i>Saviour Formosa, Elaine Sciberras, and Janice Formosa Pace</i>	
Analyzing the Central Business District: The Case of Sassari in the Sardinia Island .....	624
<i>Silvia Battino, Giuseppe Borruso, and Carlo Donato</i>	
That's ReDO: Ontologies and Regional Development Planning .....	640
<i>Francesco Scorza, Giuseppe B. Las Casas, and Beniamino Murgante</i>	
A Landscape Complex Values Map: Integration among <i>Soft</i> Values and <i>Hard</i> Values in a Spatial Decision Support System .....	653
<i>Maria Cerreta and Roberta Mele</i>	
Analyzing Migration Phenomena with Spatial Autocorrelation Techniques .....	670
<i>Beniamino Murgante and Giuseppe Borruso</i>	
From Urban Labs in the City to Urban Labs on the Web .....	686
<i>Viviana Lanza, Lucia Tilio, Antonello Azzato, Giuseppe B. Las Casas, and Piergiuseppe Pontrandolfi</i>	
<b>General Track on Geometric Modelling, Graphics and Visualization</b>	
Bilayer Segmentation Augmented with Future Evidence .....	699
<i>Silvio Ricardo Rodrigues Sanches, Valdinei Freire da Silva, and Romero Tori</i>	
A Viewer-dependent Tensor Field Visualization Using Multiresolution and Particle Tracing .....	712
<i>José Luiz Ribeiro de Souza Filho, Marcelo Caniato Renhe, Marcelo Bernardes Vieira, and Gildo de Almeida Leonel</i>	
Abnormal Gastric Cell Segmentation Based on Shape Using Morphological Operations .....	728
<i>Noor Elaiza Abdul Khalid, Nurnabilah Samsudin, and Rathiah Hashim</i>	
A Bio-inspired System for Boundary Detection in Color Natural Scenes .....	739
<i>Karin S. Komati, Evandro O.T. Salles, and Mario Sarcinelli-Filho</i>	
<b>Author Index .....</b>	753

## Table of Contents – Part III

### Workshop on Optimization Techniques and Applications (OTA 2012)

Incorporating Radial Basis Functions in Pattern Search Methods: Application to Beam Angle Optimization in Radiotherapy Treatment Planning .....	1
<i>Humberto Rocha, Joana M. Dias, Brigida C. Ferreira, and     Maria do Carmo Lopes</i>	
On the Complexity of a Mehrotra-Type Predictor-Corrector Algorithm .....	17
<i>Ana Paula Teixeira and Regina Almeida</i>	
Design of Wood Biomass Supply Chains .....	30
<i>Tiago Costa Gomes, Filipe Pereira e Alvelos, and     Maria Sameiro Carvalho</i>	
On Solving a Stochastic Programming Model for Perishable Inventory Control .....	45
<i>Eligius M.T. Hendrix, Rene Haijema, Roberto Rossi, and     Karin G.J. Pauls-Worm</i>	
An Artificial Fish Swarm Filter-Based Method for Constrained Global Optimization .....	57
<i>Ana Maria A.C. Rocha, M. Fernanda P. Costa, and     Edite M.G.P. Fernandes</i>	
Solving Multidimensional 0–1 Knapsack Problem with an Artificial Fish Swarm Algorithm .....	72
<i>Md. Abul Kalam Azad, Ana Maria A.C. Rocha, and     Edite M.G.P. Fernandes</i>	
Optimization Model of COTS Selection Based on Cohesion and Coupling for Modular Software Systems under Multiple Applications Environment .....	87
<i>Pankaj Gupta, Shilpi Verma, and Mukesh Kumar Mehlawat</i>	
A Derivative-Free Filter Driven Multistart Technique for Global Optimization .....	103
<i>Florbel P. Fernandes, M. Fernanda P. Costa, and     Edite M.G.P. Fernandes</i>	

On Lower Bounds Using Additively Separable Terms in Interval B&B .....	119
<i>José L. Berenguel, Leocadio G. Casado, I. García, Eligius M.T. Hendrix, and F. Messine</i>	
A Genetic Algorithm for the Job Shop on an ASRS Warehouse .....	133
<i>José Figueiredo, José A. Oliveira, Luis Dias, and Guilherme A.B. Pereira</i>	
On Solving the Profit Maximization of Small Cogeneration Systems .....	147
<i>Ana C.M. Ferreira, Ana Maria A.C. Rocha, Senhorinha F.C.F. Teixeira, Manuel L. Nunes, and Luís B. Martins</i>	
Global Optimization Simplex Bisection Revisited Based on Considerations by Reiner Horst .....	159
<i>Eligius M.T. Hendrix, Leocadio G. Casado, and Paula Amaral</i>	
Application of Variance Analysis to the Combustion of Residual Oils ...	174
<i>Manuel Ferreira and José Carlos Teixeira</i>	
Warehouse Design and Planning: A Mathematical Programming Approach .....	187
<i>Carla A.S. Geraldes, Maria Sameiro Carvalho, and Guilherme A.B. Pereira</i>	
Application of CFD Tools to Optimize Natural Building Ventilation Design .....	202
<i>José Carlos Teixeira, Ricardo Lomba, Senhorinha F.C.F. Teixeira, and Pedro Lobarinhas</i>	
<b>Workshop on Mobile Communications (MC 2012)</b>	
Middleware Integration for Ubiquitous Sensor Networks in Agriculture .....	217
<i>Junghoon Lee, Gyung-Leen Park, Min-Jae Kang, Ho-Young Kwak, Sang Joon Lee, and Jikwang Han</i>	
Usage Pattern-Based Prefetching: Quick Application Launch on Mobile Devices .....	227
<i>Hokwon Song, Changwoo Min, Jeehong Kim, and Young Ik Eom</i>	
EIMOS: Enhancing Interactivity in Mobile Operating Systems .....	238
<i>Sunwook Bae, Hokwon Song, Changwoo Min, Jeehong Kim, and Young Ik Eom</i>	

Development of Mobile Hybrid MedIntegraWeb App for Interoperation between u-RPMS and HIS .....	248
<i>Young-Hyuk Kim, Il-Kwon Lim, Jae-Pil Lee, Jae-Gwang Lee, and Jae-Kwang Lee</i>	
A Distributed Lifetime-Maximizing Scheme for Connected Target Coverage in WSNs .....	259
<i>Duc Tai Le, Thang Le Duc, and Hyunseung Choo</i>	
Reducing Last Level Cache Pollution in NUMA Multicore Systems for Improving Cache Performance .....	272
<i>Deukhyeon An, Jeehong Kim, JungHyun Han, and Young Ik Eom</i>	
The Fast Handover Scheme for Mobile Nodes in NEMO-Enabled PMIPv6 .....	283
<i>Changyong Park, Junbeom Park, Hao Wang, and Hyunseung Choo</i>	
A Reference Model for Virtual Resource Description and Discovery in Virtual Networks .....	297
<i>Yuemei Xu, Yanni Han, Wenjia Niu, Yang Li, Tao Lin, and Song Ci</i>	
TV Remote Control Using Human Hand Motion Based on Optical Flow System .....	311
<i>Soonmook Jeong, Taehoun Song, Keyho Kwon, and Jae Wook Jeon</i>	
Fast and Reliable Data Forwarding in Low-Duty-Cycle Wireless Sensor Networks .....	324
<i>Junseong Choe, Nguyen Phan Khanh Ha, Junguye Hong, and Hyunseung Choo</i>	
<b>Workshop on Mobile-Computing, Sensing, and Actuation for Cyber Physical Systems (MSA4CPS 2012)</b>	
Neural Network and Physiological Parameters Based Control of Artificial Pancreas for Improved Patient Safety .....	339
<i>Saad Bin Qaisar, Salman H. Khan, and Sahar Imtiaz</i>	
A Genetic Algorithm Assisted Resource Management Scheme for Reliable Multimedia Delivery over Cognitive Networks .....	352
<i>Salman Ali, Ali Munir, Saad Bin Qaisar, and Junaid Qadir</i>	
Performance Analysis of WiMAX Best Effort and ertPS Service Classes for Video Transmission .....	368
<i>Hassan Abid, Haroon Raja, Ali Munir, Jaweria Amjad, Aliya Mazhar, and Dong-Young Lee</i>	

Jump Oriented Programming on Windows Platform (on the x86) ....	376
<i>Jae-Won Min, Sung-Min Jung, Dong-Young Lee, and Tai-Myoung Chung</i>	
Cryptanalysis and Improvement of a Biometrics-Based Multi-server Authentication with Key Agreement Scheme .....	391
<i>Hakhyun Kim, Woongryul Jeon, Kwangwoo Lee, Yunho Lee, and Dongho Won</i>	
Rate-Distortion Optimized Transcoder Selection for Multimedia Transmission in Heterogeneous Networks .....	407
<i>Haroon Raja and Saad Bin Qaisar</i>	
Formal Probabilistic Analysis of Cyber-Physical Transportation Systems .....	419
<i>Atif Mashkoor and Osman Hasan</i>	

## **Workshop on Remote Sensing (RS 2012)**

DEM Reconstruction of Coastal Geomorphology from DINSAR .....	435
<i>Maged Marghany</i>	
Three-Dimensional Coastal Front Visualization from RADARSAT-1 SAR Satellite Data .....	447
<i>Maged Marghany</i>	
A New Self-Learning Algorithm for Dynamic Classification of Water Bodies .....	457
<i>Bernd Fichtelmann and Erik Borg</i>	
DEM Accuracy of High Resolution Satellite Images .....	471
<i>Mustafa Yanalak, Nebiye Musaoglu, Cengizhan Ipbuker, Elif Sertel, and Sinasi Kaya</i>	
Low Cost Pre-operative Fire Monitoring from Fire Danger to Severity Estimation Based on Satellite MODIS, Landsat and ASTER Data: The Experience of FIRE-SAT Project in the Basilicata Region (Italy) .....	481
<i>Antonio Lanorte, Fortunato De Santis, Angelo Aromando, and Rosa Lasaponara</i>	
Investigating Satellite Landsat TM and ASTER Multitemporal Data Set to Discover Ancient Canals and Acqueduct Systems .....	497
<i>Rosa Lasaponara and Nicola Masini</i>	
Using Spatial Autocorrelation Techniques and Multi-temporal Satellite Data for Analyzing Urban Sprawl .....	512
<i>Gabriele Nolè, Maria Danese, Beniamino Murgante, Rosa Lasaponara, and Antonio Lanorte</i>	

## General Track on Information Systems and Technologies

A Framework for QoS Based Dynamic Web Services Composition .....	528
<i>Jigyasu Nema, Rajdeep Niyogi, and Alfredo Milani</i>	
Data Summarization Model for User Action Log Files .....	539
<i>Eleonora Gentili, Alfredo Milani, and Valentina Poggioni</i>	
User Modeling for Adaptive E-Learning Systems .....	550
<i>Birol Ciloglugil and Mustafa Murat Inceoglu</i>	
An Experimental Study of the Combination of Meta-Learning with Particle Swarm Algorithms for SVM Parameter Selection .....	562
<i>Péricles B.C. de Miranda, Ricardo B.C. Prudêncio, Andre Carlos P.L.F. de Carvalho, and Carlos Soares</i>	
An Investigation into Agile Methods in Embedded Systems Development .....	576
<i>Caroline Oliveira Albuquerque, Pablo Oliveira Antonino, and Elisa Yumi Nakagawa</i>	
Heap Slicing Using Type Systems .....	592
<i>Mohamed A. El-Zawawy</i>	
Using Autonomous Search for Generating Good Enumeration Strategy Blends in Constraint Programming .....	607
<i>Ricardo Soto, Broderick Crawford, Eric Monfroy, and Víctor Bustos</i>	
Evaluation of Normalization Techniques in Text Classification for Portuguese .....	618
<i>Merley da Silva Conrado, Víctor Antonio Laguna Gutiérrez, and Solange Oliveira Rezende</i>	
Extracting Definitions from Brazilian Legal Texts .....	631
<i>Edilson Ferneda, Hércules Antonio do Prado, Augusto Herrmann Batista, and Marcello Sandi Pinheiro</i>	
A Heuristic Diversity Production Approach .....	647
<i>Hamid Parvin, Hosein Alizadeh, Sajad Parvin, and Behzad Maleki</i>	
Structuring Taxonomies from Texts: A Case-Study on Defining Soil Classes .....	657
<i>Hércules Antonio do Prado, Edilson Ferneda, Francisco Carlos da Luz Rodrigues, Éder Martins de Souza, Osmar Abílio de Carvalho Jr., and Alfredo José Barreto Luiz</i>	
Exploring Fuzzy Ontologies in Mining Generalized Association Rules ...	667
<i>Rodrigo Moura Juvenil Ayres, Marcela Xavier Ribeiro, and Marilde Terezinha Prado Santos</i>	

BTA: Architecture for Reusable Business Tier Components with Access Control .....	682
<i>Óscar Mortágua Pereira, Rui L. Aguiar, and Maribel Yasmina Santos</i>	
Analysing the PDDL Language for Argumentation-Based Negotiation Planning .....	698
<i>Ariel Monteserin, Luis Berdún, and Analía A. Amandi</i>	
Predicting Potential Responders in Twitter: A Query Routing Algorithm .....	714
<i>Cleyton Caetano de Souza, Jonathas José de Magalhães, Evandro Barros de Costa, and Joseana Macêdo Fechine</i>	
Towards a Goal Recognition Model for the Organizational Memory .....	730
<i>Marcelo G. Armentano and Analía A. Amandi</i>	
SART: A New Association Rule Method for Mining Sequential Patterns in Time Series of Climate Data .....	743
<i>Marcos Daniel Cano, Marilde Terezinha Prado Santos, Ana Maria H. de Avila, Luciana A.S. Romani, Agma J.M. Traina, and Marcela Xavier Ribeiro</i>	
<b>Author Index .....</b>	<b>759</b>

## Table of Contents – Part IV

### Workshop on Software Engineering Processes and Applications (SEPA 2012)

Modeling Road Traffic Signals Control Using UML and the MARTE Profile .....	1
<i>Eduardo Augusto Silvestre and Michel dos Santos Soares</i>	
Analysis of Techniques for Documenting User Requirements .....	16
<i>Michel dos Santos Soares and Daniel Souza Cioquette</i>	
Predicting Web Service Maintainability via Object-Oriented Metrics: A Statistics-Based Approach .....	29
<i>José Luis Ordiales Coscia, Marco Crasso, Cristian Mateos, Alejandro Zunino, and Sanjay Misra</i>	
Early Automated Verification of Tool Chain Design .....	40
<i>Matthias Biehl</i>	
Using UML Stereotypes to Support the Requirement Engineering: A Case Study .....	51
<i>Vitor A. Batista, Daniela C.C. Peixoto, Wilson Pádua, and Clarindo Isaías P.S. Pádua</i>	
Identifying Business Rules to Legacy Systems Reengineering Based on BPM and SOA .....	67
<i>Gleison S. do Nascimento, Cirano Iochpe, Lucinéia Thom, André C. Kalsing, and Álvaro Moreira</i>	
Abstraction Analysis and Certified Flow and Context Sensitive Points-to Relation for Distributed Programs .....	83
<i>Mohamed A. El-Zawawy</i>	
An Approach to Measure Understandability of Extended UML Based on Metamodel .....	100
<i>Yan Zhang, Yi Liu, Zhiyi Ma, Xuying Zhao, Xiaokun Zhang, and Tian Zhang</i>	
Dealing with Dependencies among Functional and Non-functional Requirements for Impact Analysis in Web Engineering .....	116
<i>José Alfonso Aguilar, Irene Garrigós, Jose-Norberto Mazón, and Aníbal Zaldívar</i>	

Assessing Maintainability Metrics in Software Architectures Using COSMIC and UML .....	132
<i>Eudisley Gomes dos Anjos, Ruan Delgado Gomes, and Mário Zenha-Rela</i>	
Plagiarism Detection in Software Using Efficient String Matching .....	147
<i>Kusum Lata Pandey, Suneeta Agarwal, Sanjay Misra, and Rajesh Prasad</i>	

Dynamic Software Maintenance Effort Estimation Modeling Using Neural Network, Rule Engine and Multi-regression Approach .....	157
<i>Ruchi Shukla, Mukul Shukla, A.K. Misra, T. Marwala, and W.A. Clarke</i>	

## **Workshop on Software Quality (SQ 2012)**

New Measures for Maintaining the Quality of Databases .....	170
<i>Hendrik Decker</i>	

A New Way to Determine External Quality of ERP Software .....	186
<i>Ali Orhan Aydin</i>	

Towards a Catalog of Spreadsheet Smells .....	202
<i>Jácome Cunha, João P. Fernandes, Hugo Ribeiro, and João Saraiva</i>	

Program and Aspect Metrics for MATLAB .....	217
<i>Pedro Martins, Paulo Lopes, João P. Fernandes, João Saraiva, and João M.P. Cardoso</i>	

A Suite of Cognitive Complexity Metrics .....	234
<i>Sanjay Misra, Murat Koyuncu, Marco Crasso, Cristian Mateos, and Alejandro Zunino</i>	

Complexity Metrics for Cascading Style Sheets .....	248
<i>Adewole Adewumi, Sanjay Misra, and Nicholas Iku-Omoregbe</i>	

A Systematic Review on the Impact of CK Metrics on the Functional Correctness of Object-Oriented Classes .....	258
<i>Yasser A. Khan, Mahmoud O. Elish, and Mohamed El-Attar</i>	

## **Workshop on Security and Privacy in Computational Sciences (SPCS 2012)**

Pinpointing Malicious Activities through Network and System-Level Malware Execution Behavior .....	274
<i>André Ricardo Abed Grégio, Vitor Monte Afonso, Dario Simões Fernandes Filho, Paulo Lício de Geus, Mario Jino, and Rafael Duarte Coelho dos Santos</i>	

A Malware Detection System Inspired on the Human Immune System .....	286
<i>Isabela Liane de Oliveira, André Ricardo Abed Grégio, and Adriano Mauro Cansian</i>	
Interactive, Visual-Aided Tools to Analyze Malware Behavior .....	302
<i>André Ricardo Abed Grégio, Alexandre Or Cansian Baruque, Vitor Monte Afonso, Dario Simões Fernandes Filho, Paulo Lício de Geus, Mario Jino, and Rafael Duarte Coelho dos Santos</i>	
Interactive Analysis of Computer Scenarios through Parallel Coordinates Graphics.....	314
<i>Gabriel D. Cavalcante, Sébastien Tricaud, Cleber P. Souza, and Paulo Lício de Geus</i>	
Methodology for Detection and Restraint of P2P Applications in the Network .....	326
<i>Rodrigo M.P. Silva and Ronaldo M. Salles</i>	
<b>Workshop on Soft Computing and Data Engineering (SCDE 2012)</b>	
Text Categorization Based on Fuzzy Soft Set Theory .....	340
<i>Bana Handaga and Mustafa Mat Deris</i>	
Cluster Size Determination Using JPEG Files .....	353
<i>Nurul Azma Abdullah, Rosziati Ibrahim, and Kamaruddin Malik Mohamad</i>	
Semantic Web Search Engine Using Ontology, Clustering and Personalization Techniques .....	364
<i>Noryusliza Abdullah and Rosziati Ibrahim</i>	
Granules of Words to Represent Text: An Approach Based on Fuzzy Relations and Spectral Clustering .....	379
<i>Patrícia F. Castro and Geraldo B. Xexéo</i>	
Multivariate Time Series Classification by Combining Trend-Based and Value-Based Approximations .....	392
<i>Bilal Esmael, Arghad Arnaout, Rudolf K. Frühwirth, and Gerhard Thonhauser</i>	

## General Track on High Performance Computing and Networks

Impact of <i>pay-as-you-go</i> Cloud Platforms on Software Pricing and Development: A Review and Case Study .....	404
<i>Fernando Pires Barbosa and Andrea Schwertner Charão</i>	
Resilience for Collaborative Applications on Clouds: Fault-Tolerance for Distributed HPC Applications .....	418
<i>Toàn Nguyêñ and Jean-Antoine Désidéri</i>	
T-DMB Receiver Model for Emergency Alert Service .....	434
<i>Seong-Geun Kwon, Suk-Hwan Lee, Eung-Joo Lee, and Ki-Ryong Kwon</i>	
A Framework for Context-Aware Systems in Mobile Devices .....	444
<i>Eduardo Jorge, Matheus Farias, Rafael Carmo, and Weslley Vieira</i>	
A Simulation Framework for Scheduling Performance Evaluation on CPU-GPU Heterogeneous System .....	457
<i>Flavio Vella, Igor Neri, Osvaldo Gervasi, and Sergio Tasso</i>	
Influence of Topology on Mobility and Transmission Capacity of Human-Based DTNs .....	470
<i>Danilo A. Moschetto, Douglas O. Freitas, Lourdes P.P. Poma, Ricardo Aparecido Perez de Almeida, and Cesar A.C. Marcondes</i>	
Towards a Computer Assisted Approach for Migrating Legacy Systems to SOA .....	484
<i>Gonzalo Salvatierra, Cristian Mateos, Marco Crasso, and Alejandro Zunino</i>	
1+1 Protection of Overlay Distributed Computing Systems: Modeling and Optimization .....	498
<i>Krzysztof Walkowiak and Jacek Rak</i>	
Scheduling and Capacity Design in Overlay Computing Systems .....	514
<i>Krzysztof Walkowiak, Andrzej Kasprzak, Michał Kosowski, and Marek Miziołek</i>	
GPU Acceleration of the <b>caffa3d.MB</b> Model .....	530
<i>Pablo Igouinet, Pablo Alfaro, Gabriel Usera, and Pablo Ezzatti</i>	
Security-Effective Fast Authentication Mechanism for Network Mobility in Proxy Mobile IPv6 Networks .....	543
<i>Illkyun Im, Young-Hwa Cho, Jae-Young Choi, and Jongpil Jeong</i>	
An Architecture for Service Integration and Unified Communication in Mobile Computing .....	560
<i>Ricardo Aparecido Perez de Almeida and Hélio C. Guardia</i>	

Task Allocation in Mesh Structure: 2Side LeapFrog Algorithm and Q-Learning Based Algorithm .....	576
<i>Iwona Pozniak-Koszalka, Wojciech Proma, Leszek Koszalka, Maciej Pol, and Andrzej Kasprzak</i>	
Follow-Us: A Distributed Ubiquitous Healthcare System Simulated by MannaSim .....	588
<i>Maria Luísa Amarante Ghizoni, Adauto Santos, and Linnyer Beatrys Ruiz</i>	
Adaptive Dynamic Frequency Scaling for Thermal-Aware 3D Multi-core Processors .....	602
<i>Hong Jun Choi, Young Jin Park, Hsien-Hsin Lee, and Cheol Hong Kim</i>	
A Context-Aware Service Model Based on the OSGi Framework for u-Agricultural Environments .....	613
<i>Jongsun Choi, Sangjoon Park, Jongchan Lee, and Yongyun Cho</i>	
A Security Framework for Blocking New Types of Internet Worms in Ubiquitous Computing Environments .....	622
<i>Iksu Kim and Yongyun Cho</i>	
Quality Factors in Development Best Practices for Mobile Applications .....	632
<i>Euler Horta Marinho and Rodolfo Ferreira Resende</i>	
ShadowNet: An Active Defense Infrastructure for Insider Cyber Attack Prevention .....	646
<i>Xiaohui Cui, Wade Gasior, Justin Beaver, and Jim Treadwell</i>	
<b>Author Index .....</b>	<b>655</b>