Preface

These multiple volumes (LNCS volumes 10404, 10405, 10406, 10407, 10408, and 10409) consist of the peer-reviewed papers from the 2017 International Conference on Computational Science and Its Applications (ICCSA 2017) held in Trieste, Italy, during July 3–6, 2017.

ICCSA 2017 was a successful event in the ICCSA conference series, previously held in Beijing, China (2016), Banff, Canada (2015), Guimarães, Portugal (2014), Ho Chi Minh City, Vietnam (2013), Salvador, Brazil (2012), Santander, Spain (2011), Fukuoka, Japan (2010), Suwon, South 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).

Computational science is a main pillar of most present research as well as industrial and commercial activities and plays a unique role in exploiting ICT innovative technologies. The ICCSA conference series have been providing a venue to researchers and industry practitioners to discuss new ideas, to share complex problems and their solutions, and to shape new trends in computational science.

Apart from the general tracks, ICCSA 2017 also include 43 international workshops, in various areas of computational sciences, ranging from computational science technologies to specific areas of computational sciences, such as computer graphics and virtual reality. Furthermore, this year ICCSA 2017 hosted the XIV International Workshop on Quantum Reactive Scattering. The program also features three keynote speeches and four tutorials.

The success of the ICCSA conference series in general, and ICCSA 2017 in particular, is due to the support of many people: authors, presenters, participants, keynote speakers, session chairs, Organizing Committee members, student volunteers, Program Committee members, international Advisory Committee members, international liaison chairs, and various people in other roles. We would like to thank them all.

We would also like to thank Springer for their continuous support in publishing the ICCSA conference proceedings.

July 2017

Giuseppe Borruso
Osvaldo Gervasi
Bernady O. Apduhan
Welcome to Trieste

We were honored and happy to have organized this extraordinary edition of the conference, with so many interesting contributions and participants coming from more than 46 countries around the world!

Trieste is a medium-size Italian city lying on the north-eastern border between Italy and Slovenia. It has a population of nearly 200,000 inhabitants and faces the Adriatic Sea, surrounded by the Karst plateau.

It is quite an atypical Italian city, with its history being very much influenced by belonging for several centuries to the Austro-Hungarian empire and having been through several foreign occupations in history: by French, Venetians, and the Allied Forces after the Second World War. Such events left several footprints on the structure of the city, on its buildings, as well as on culture and society!

During its history, Trieste hosted people coming from different countries and regions, making it a cosmopolitan and open city. This was also helped by the presence of a commercial port that made it an important trade center from the 18th century on. Trieste is known today as a ‘City of Science’ or, more proudly, presenting itself as the ‘City of Knowledge’, thanks to the presence of several universities and research centers, all of them working at an international level, as well as of cultural institutions and traditions. The city has a high presence of researchers, more than 35 per 1,000 employed people, much higher than the European average of 6 employed researchers per 1,000 people.

The University of Trieste, the origin of such a system of scientific institutions, dates back to 1924, although its roots go back to the end of the 19th century under the Austro-Hungarian Empire. The university today employs nearly 1,500 teaching, research, technical, and administrative staff with a population of more than 16,000 students.

The university currently has 10 departments: Economics, Business, Mathematical, and Statistical Sciences; Engineering and Architecture; Humanities; Legal, Language, Interpreting, and Translation Studies; Mathematics and Geosciences; Medicine, Surgery, and Health Sciences; Life Sciences; Pharmaceutical and Chemical Sciences; Physics; Political and Social Sciences.

We trust the participants enjoyed the cultural and scientific offerings of Trieste and will keep a special memory of the event.

Giuseppe Borruso
Organization

ICCSA 2017 was organized by the University of Trieste (Italy), University of Perugia (Italy), Monash University (Australia), Kyushu Sangyo University (Japan), University of Basilicata (Italy), and University of Minho, (Portugal).

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Contents – Part III

Workshop on Chemistry and Materials Sciences and Technologies (CMST 2017)

Acetone-Water Mixtures: Molecular Dynamics Using a Semiempirical Intermolecular Potential ................................................. 3
   Noelia Faginas-Lago, Margarita Alberti, Andrea Lombardi,
   and Federico Palazzetti

Synchronized Content and Metadata Management in a Federation of Distributed Repositories of Chemical Learning Objects ............. 14
   Sergio Tasso, Simonetta Pallottelli, Osvaldo Gervasi, Razvan Tanase,
   and Marina Rui

Open Molecular Science for the Open Science Cloud ......................... 29
   Antonio Laganà, Gabor Terstyanszky, and Jens Krüger

Determination of Volatile Aroma Composition Profiles of Coco de Mèr (Lodoicea Maldivica) Fruit: Analytical Study by HS-SPME and GC/MS Techniques ................................................................. 44
   Bartolomeo Sebastiani, Donatella Malfatti, Martino Giorgini,
   and Stefano Falcinelli

Automated Simulation of Gas-Phase Reactions on Distributed and Cloud Computing Infrastructures ........................................ 60
   Sergio Rampino, Loriano Storchi, and Antonio Laganà

Workshop on Computational Optimization and Applications (COA 2017)

A Global Score-Driven Beam Angle Optimization in IMRT .................. 77
   Humberto Rocha, Joana M. Dias, Tiago Ventura,
   Brígida C. Ferreira, and Maria do Carmo Lopes

Automated Radiotherapy Treatment Planning Using Fuzzy Inference Systems ................................................................. 91
   Joana Dias, Humberto Rocha, Tiago Ventura, Brígida Ferreira,
   and Maria do Carmo Lopes

Continuous Relaxation of MINLP Problems by Penalty Functions: A Practical Comparison .................................................. 107
   M. Fernanda P. Costa, Ana Maria A.C. Rocha,
   and Edite M.G.P. Fernandes
Combining Filter Method and Dynamically Dimensioned Search for Constrained Global Optimization ........................................... 119
   M. Joseane F. G. Macêdo, M. Fernanda P. Costa,
   Ana Maria A.C. Rocha, and Elizabeth W. Karas

Optimal Schedule of Home Care Visits for a Health Care Center .......... 135
   Filipe Alves, Ana I. Pereira, Florbela P. Fernandes, Adília Fernandes,
   Paulo Leitão, and Anabela Martins

Neighborhood Analysis on the University Timetabling Problem ............ 148
   Edmar Hell Kampke, Erika Almeida Segatto,
   Maria Claudia Silva Boeres, Maria Cristina Rangel,
   and Geraldo Regis Mauri

On Grid Aware Refinement of the Unit Hypercube and Simplex:
Focus on the Complete Tree Size ........................................... 165
   L.G. Casado, E.M.T. Hendrix, J.M.G. Salmerón, B. G.-Tóth,
   and I. García

Workshop on Cities, Technologies and Planning (CTP 2017)

Identifying and Using Key Indicators to Determine Neighborhood Types in Different Regions ................................................. 183
   Harutyun Shahumyan, Chao Liu, Brendan Williams, Gerrit Knaap,
   and Daniel Engelberg

Automated Valuation Methods in Atypical Real Estate Markets
Using the Mono-parametric Approach ....................................... 200
   Marina Ciuna, Manuela De Ruggiero, Benedetto Manganelli,
   Francesca Salvo, and Marco Simonotti

Urban Planning and Technological Innovation ................................ 210
   Teresa Cilona

Jewish Communities in Pre-war Central Poland as an Example
of a Self-organising Society .................................................... 224
   Małgorzata Hanzl

The Time Machine. Cultural Heritage and the Geo-Referenced
Storytelling of Urban Historical Metamorphose ............................ 239
   Letizia Bollini and Daniele Begotti

Risk Prevention and Management. A Multi-actor and Knowledge-Based
Approach in Low Density Territories ......................................... 252
   Alessandro Plaisant, Miriam Mastinu, and Daniela Sini
Flickr as a Tool for the Analysis of Photographic Tourism: The Estimation of Geotagging Rate and Its Use for Mapping the World. .......................... 266
Gian Pietro Zaccomer and Luca Grassetti

From SMART Cities to SMART City-Regions: Reflections and Proposals ... 282
Ilaria Greco and Angela Cresta

An Approach for Semantically Enriching Volunteered Geographic Data with Linked Data. ................................................................. 296
Liliane Soares da Costa, Italo Lopes Oliveira, Alexandra Moreira,
and Jugurta Lisboa-Filho

Demographic Data and Remote Sensing to Monitor Urban Growth:
The Ho Chi Minh City (Vietnam) Case Study ................................. 307
Giovanni Mauro, Andrea Favretto, and Duy Vô Hoàng

Quantifying Sustainable Growth Through a Morphological Approach
Comparison to Population Density Measurements ....................... 327
Malgorzata Hanzl and Lia Maria Dias Bezerra

Exploring the Resilience of Urban Systems Using Fuzzy Cognitive Maps ... 338
Marta Bottero, Giulia Datola, and Roberto Monaco

Seismic Risk Assessment of Hospitals in Lima City Using GIS Tools ....... 354
Sandra Santa-Cruz, Juan Palomino, Nicola Liguori, Marco Vona,
and Rodrigo Tamayo

Smart City Governance in the Geo-resources Planning Paradigm
in the Metropolitan City of Cagliari (Italy) ................................. 368
Ginevra Balletto and Chiara Garau

Quality of Experience for Personalized Sightseeing Tours: Studies
and Proposition for an Evaluation Method ................................. 380
Mayeul Mathias, Camille Béguin, Juan-Manuel Torres-Moreno,
Didier Josselin, Delphine Picolot, Fen Zhou, and Marie-Sylvie Poli

Workshop on Deep Cities: Intelligence and Interoperability
(DEEP CITY 2017)

Towards a Decision Support Tool for Assessing, Managing
and Mitigating Seismic Risk of Electric Power Networks .................. 399
Sonia Giovinazzi, Maurizio Pollino, Indranil Kongar, Tiziana Rossetto,
Emanuela Caiaffa, Antonio Di Pietro, Luigi La Porta, Vittorio Rosato,
and Alberto Tofani
An Approach to Provide Shared Architectural Principles for Interoperable
Smart Cities ................................................................. 415
  Vatsal Bhatt, Arianna Bruti, Martin Burns, and Angelo Frascella

Online Anomaly Detection on Rain Gauge Networks for Robust Alerting
Services to Citizens at Risk from Flooding ............................. 427
  Grazia Fattoruso, Annalista Agresta, Saverio De Vito,
  Antonio Buonanno, Mario Molinara, Claudio Marocco,
  Francesco Tortorella, and Girolamo Di Francia

Computational Intelligence for Smart Air Quality Monitors Calibration .... 443
  Elena Esposito, Saverio De Vito, Maria Salvato, Grazia Fattoruso,
  and Girolamo Di Francia

Smart Stormwater Management in Urban Areas by Roofs Greening ........... 455
  Mirka Mobilia and Antonia Longobardi

Workshop on Econometrics and Multidimensional Evaluation
in the Urban Environment (EMEUE 2017)

Genetic Algorithms for Real Estate Market Analysis ........................ 467
  Vincenzo Del Giudice, Pierfrancesco De Paola, and Fabiana Forte

Bayesian Neural Network Models in the Appraisal
of Real Estate Properties .................................................. 478
  Vincenzo Del Giudice, Pierfrancesco De Paola, and Fabiana Forte

An Assessment Model for the Periodic Reviews of the Market
Values of Property Assets .................................................. 490
  Francesco Tajani, Klimis Ntalianis, and Felicia Di Liddo

Tentative Reflections on Construction of Assessment Models for Buildings’
Sustainability Certification ................................................ 501
  Maria Fiorella Granata

Local Communities and Management of Cultural Heritage
of the Inner Areas. An Application of Break-Even Analysis ............... 516
  Francesco Calabrò

Choice Experiments: An Application for the Corona Verde Landscape
in Turin (Italy) .................................................................. 532
  Marta Bottero, Giada Cozza, Roberto Fontana, and Roberto Monaco

Public and Private Interests in Urban Regeneration Programs:
The Case Study of Trieste Historic Centre ................................ 547
  Mauro Crescenzo, Marta Bottero, and Luigi Buzzacchi
An Integrated Approach for the Assessment of Urban Transformation
Proposals in Historic and Consolidated Tissues

Maria Rosaria Guarini, Anthea Chiovitti, Fabrizio Battisti, and Pierluigi Morano

The Information Value for Territorial and Economic Sustainability in the Enhancement of the Water Management Process

Salvatore Giuffrida, Maria Rosa Trovato, and Marcella Falzone

From the Object to Land. Architectural Design and Economic Valuation in the Multiple Dimensions of the Industrial Estates

Salvatore Giuffrida and Maria Rosa Trovato

Conflicting Values in Designing Adaptive Reuse for Cultural Heritage. A Case Study of Social Multicriteria Evaluation

Alessandra Oppio and Marta Bottero

Rethinking Feasibility Analysis for Urban Development: A Multidimensional Decision Support Tool

Alberto Colorni, Valentina Ferretti, Alessandro Luì, Alessandra Oppio, Valerio Paruscio, and Luca Tomasini

Experimenting CIE and CBA in Urban Restoration

Carmelo Maria Torre, Pierluigi Morano, and Francesco Tajani

Workshop on Emotion Recognition (EMORE 2917)

A Web-Based System for Emotion Vector Extraction

Valentina Franzoni, Giulio Biondi, and Alfredo Milani

Ontology-Based Sentiment Analysis of Kazakh Sentences

Banu Yergesh, Gulmira Bekmanova, Alrynbek Sharipbay, and Manas Yergesh

Automatic Detection of a Driver’s Complex Mental States

Zhiyi Ma, Marwa Mahmoud, Peter Robinson, Eduardo Dias, and Lee Skrypchuk

EmEx, a Tool for Automated Emotive Face Recognition Using Convolutional Neural Networks

Matteo Riganelli, Valentina Franzoni, Osvaldo Gervasi, and Sergio Tasso

“Humble” Politicians and Their Multimodal Communication

Francesca D’Errico and Isabella Poggi
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Deep Learning Semantic Approach to Emotion Recognition</td>
<td>718</td>
</tr>
<tr>
<td>Using the IBM Watson Bluemix Alchemy Language</td>
<td></td>
</tr>
<tr>
<td><em>Giulio Biondi, Valentina Franzoni, and Valentina Poggioni</em></td>
<td></td>
</tr>
<tr>
<td>Community Branding (Co-Bra): A Collaborative Decision Making Process</td>
<td>730</td>
</tr>
<tr>
<td>for Urban Regeneration</td>
<td></td>
</tr>
<tr>
<td><em>Maria Cerreta and Gaia Daldanise</em></td>
<td></td>
</tr>
<tr>
<td>Deliberative Spatial Multi-Criteria Evaluation (DSM-CE): Forming Shared Cultural Values</td>
<td>747</td>
</tr>
<tr>
<td><em>Maria Cerreta and Simona Panaro</em></td>
<td></td>
</tr>
<tr>
<td>Author Index</td>
<td>765</td>
</tr>
</tbody>
</table>