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Computational Science and Its Applications – ICCSA 2017

17th International Conference
Trieste, Italy, July 3–6, 2017
Proceedings, Part III

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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

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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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