

# Preface

It is our pleasure to present the proceedings of ICTERI 2014, the 10th International Conference on Information and Communication Technologies (ICT) in Education, Research, and Industrial Applications: Integration, Harmonization, and Knowledge Transfer.

The conference was planned to be held at Kherson, Ukraine, during June 9–12, 2014. But unfortunately, due to the tense situation in the country,<sup>1</sup> we had to cancel the face-to-face gathering of the conference participants. Based on the results of the review process, however, we were convinced that some of the submissions deserved to be published, and are of interest to the scientific community. We therefore decided to invite the authors of the best papers, to revise and extend these and to submit them for publication in this volume.

Thus, the selection was made in two phases, as the resubmitted papers were again reviewed by at least three peers based on the scientific and technical quality, anticipated reader interest, and coverage of the conference scope. Finally, the Program Committee selected the 16 most mature and interesting papers. This led to an acceptance rate of 24.2 % out of the initially 66 submitted papers.

ICTERI as a conference series is concerned with interrelated topics of the development, deployment, and use of ICT that are vibrant for both the academic and industrial communities: education, research, industrial applications, and cooperation in ICT-related aspects. The selected papers reflect that scope and are grouped into three parts: (I) Frameworks and Tools; (II) ICT in Teaching and Learning; and (III) ICT in Research and Industrial Applications.

The volume begins with the written versions of the keynote talks planned for ICTERI 2014. Vladimir Gorodetsky gives a research-oriented overview of the phenomenon of Big Data. Nick Bassiliades presents an approach and a tool to compare university rankings so that safe conclusions about their reliability are drawn; this is done by extracting data from several ranking lists and linking it to the DBpedia linked open dataset.

Part I of the volume presents the state-of-the-art formal and algorithmic frameworks aimed at enabling further ICT development and also software tools based on such formalisms. It starts with a paper contributing a novel soft computing algorithm for multiplying fuzzy sets based on the formalism of universal analytic models. The second paper deals with developing a theoretical framework for formalizing the dynamics of systems at an abstract level and taking into account the continuous nature of time. The third paper formalizes complex event processing based on pre-automata. The fourth paper analyzes the algebraic properties of nominative data and functions. Finally, the

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<sup>1</sup> See for example <http://research.un.org/en/ukraine>.

fifth paper reports on a software framework that uses rewriting rules for the automated adjustment of parallel tasks in a target platform for parallel computations. These papers also indicate the applications for which the presented results may be useful.

Part II focuses on using ICT in or developing ICT for teaching and learning, and their effects on didactics. The first paper presents an original approach of using demo hardware for enabling better and deeper understanding by IT students of the inner workings of a processor. The second paper studies the challenges of learning and using the Git system for distributed version control in development projects. This study bases on the experience gained in several different kinds of computing courses, and results in a set of recommendations. The third paper surveys the practices of IT formation at Ukrainian universities and proposes, as a result, an IT competence model as a methodological core for ramping-up the IT competences of Ukrainian students. The fourth paper focuses on the proposal of a pedagogical framework for improving the efficiency in learning ICT through a collaborative approach. This framework involves school teachers and university students of pedagogy and bases on the outcomes of a series of ICT workshops that had been held with representatives of these groups. The fifth paper addresses the efficiency of an ICT-based learning environment for postgraduate students based on a set of proposed criteria. Finally, the sixth paper deals with accounting for a dominant learning style of IT students for developing more effective targeted course materials.

Part III of the volume is dedicated to the applications of ICT in research and industry. The first paper looks at how ICT may help transform Bio-Design into an industrial strength discipline. It is based on the four core hypotheses which formed the basics for the development of the MENDEL Bio-Design software platform. The second paper deals with the applications in the Airspace industry. It proposes an approach to the analysis of the verification objectives and features of on-board information and control software at development and operation lifecycle stages. The third paper proposes an evolutionary game-theoretic approach for modeling and optimizing Internet connections in telecommunications. The fourth paper proposes a model of an evolutionary stable strategy for the choice of an appropriate social behavior pattern, based on the Cournot competition formalism, for the companies on a homogeneous product market. Finally, the fifth paper analyzes the performance of the off-the-shelf plagiarism detection software and elaborates the recommendations for their effective use in electronic publications domain

This volume would not have materialized without the support of many people. First, we are very grateful to all the authors for their continuous commitment and intensive work. Second, we would like to thank the Program Committee members and additional reviewers for providing timely and thorough assessments, and also for being very cooperative in doing additional review work at short notice. Furthermore, we would like to thank all the people who contributed to the organization of ICTERI 2014.

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