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*Editor*

# Computer Modeling and Intelligent Systems

Proceedings of The Third International Workshop  
CMIS-2020



Zaporizhzhia, Ukraine  
April 27- May 1, 2020

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This volume represents the proceedings of the Third International Workshop on Computer Modeling and Intelligent Systems (CMIS-2020), held in Zaporizhzhia, Ukraine, in April-May, 2020. It comprises 83 contributed papers that were carefully peer-reviewed and selected from 177 submissions.

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## Preface

It is my pleasure to present you the proceedings of The Third International Workshop on Computer Modeling and Intelligent Systems (CMIS-2020), held in Zaporizhzhia, Ukraine on 27 of April - 1 of May 2020.

The CMIS workshop was held in 2020 for the third time at the National University "Zaporizhzhia Polytechnic" (<http://www.zp.edu.ua>), which is the largest and oldest regional center for science and higher education in the Zaporizhzhia region of south-eastern Ukraine.

More than ten thousand students of Bachelor, Master, and PhD programs study also as more than seven hundred research and teaching staff work at the university. In the last decade, the role of IT specialties has significantly increased at the university. The leading place in the training of specialists in the fields of Software Engineering and Computer Science is occupied by the Department of Software Tools (<http://pz.zntu.net>), which is the largest IT department in the region and the largest university's department in terms of the number of students. The Department of Software Tools of the National University "Zaporizhzhia Polytechnic" was the organizer and base for all CMIS workshops, including the CMIS-2020 workshop.

The National University "Zaporizhzhia Polytechnic" celebrates its 120th anniversary in 2020. The Third International Workshop on Computer Modeling and Intelligent Systems (CMIS-2020) is timed to coincide with this significant event.

The main purpose of the CMIS-2020 workshop is a discussion of the recent research results in all areas of Computer Sciences and Information Technologies.

The workshop is soliciting literature review, survey and research papers including, whilst not limited to, the following areas of interest:

- Information Technologies for Decision Making, Optimization and Control;
- Information Systems and Data Processing;
- Advanced Info-Communicational Technologies;
- Information Technologies for Computer Modeling;
- Computing in Applications;
- Intelligent Information Technologies;
- Information Technologies for Data Mining, Signal and Image Processing.

The workshop joined scientists from Belarus, Belgium, China, Czech Republic, Germany, Indonesia, Poland, Russia, Slovak Republic, Spain, Ukraine, and United States of America.

The language of CMIS-2020 Workshop is English. The workshop took the form of oral presentations of peer-reviewed regular papers. The video of presentations is available at <https://www.facebook.com/groups/cmisis.workshop/>.

The CMIS-2020 Organizing Committee have received 177 paper submissions (instead of 130 submissions in 2019), out of which 83 were accepted for presentation as a regular papers (instead of 81 in 2019) in the result of reviewing process, where the editor, program committee members, external and peer reviewers sought to ensure a high scientific level, as well as a high-quality presentation of the selected papers.

The paper acceptance ratio in 2020 was 47% (instead of 62% in 2019). These papers were published in this volume of CMIS-2020 proceedings.

The workshop would not have been possible without the support of many people. I would like to thank the Workshop Program Committee Members, organization staff, and external reviewers for their excellent and tireless work. I sincerely wish that all attendees benefited scientifically from the workshop and wish them every success in their research. It is the humble wish of the workshop organizers that the professional dialogue among the researchers, scientists, and engineers continues beyond the event and that the friendships and collaborations forged will linger and prosper for many years to come.

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