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(Eds.)



**Proceedings of the 1st International Workshop on
Digital Content & Smart Multimedia (DCSMart 2019):
Volume 1**

Lviv, Ukraine
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This volume represents the proceedings of the 1st International Workshop on Digital Content & Smart Multimedia, held in Lviv, Ukraine, in December, 2019. It comprises 30 contributed papers that were carefully peer-reviewed and selected out of 79 submissions.

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Preface

It is our pleasure to present to you the proceedings of the 1st International Workshop on Digital Content & Smart Multimedia (DCSMart 2019). This volume represents the proceedings of the DCSMart 2019 workshop's tracks, which took place in Lviv, Ukraine, on December 23-25, 2019.

Digital Content & Smart Multimedia is a focused workshop to promote the exchange of the latest advances in smart content processing & multimedia technologies, systems and applications. The main purpose of the DCSMart 2019 workshop is a discussion of the recent research results within such tracks:

- Multimedia Data Mining and Data Management;
- Security and Privacy Issues on Digital Content;
- Design and Implementation of Multimedia Software;
- 3D Imaging, Animation and Virtual Reality.

The workshop was soliciting only regular papers that had to present original reports of substantive new research techniques, findings or applications and clearly indicate innovative aspects. Detailed presented research procedures or technical solutions should be accompanied by experimental investigations. The paper's results had to be new, clear and well-argued.

Submission of papers to the workshop was open to all authors from around the world within the framework of the domain area concerning smart multimedia.

The DCSMart 2019 joined scientists from Ukraine, France, Austria, Sweden, Norway, Turkey, Slovak Republic, the Czech Republic, Poland, Bulgaria, Canada, and Russia together with practicing engineers. In general, the representatives from 14 Universities from around the world and 11 Ukraine Universities, as well as 2 Norwegian and Ukrainian companies have taken part in the workshop:

University of Vienna	Austria
Jan Evangelista Purkyně University in Ústí nad Labem	Czech Republic
Telecom Sudparis	France
Karabuk University	Turkey
Oslo Metropolitan University	Norway
Cracow University of Technology	Poland
Istanbul Medeniyet University	Turkey
Linnaeus University	Sweden
University of Library Studies and Information Technologies	Bulgaria
Halic University	Turkey
Istanbul University-Cerrahpasa	Turkey
University of Warmia and Mazury	Poland
Brock University	Canada
Comenius University in Bratislava	Slovak Republic
South Ural State University	Russia
Lviv Polytechnic National University,	Ukraine
Taras Shevchenko National University of Kyiv	Ukraine
Ukrainian Academy of Printing	Ukraine
Khmelnitskyi National University	Ukraine
National Aerospace University "Kharkiv Aviation Institute"	Ukraine
Ivan Franko National University of Lviv	Ukraine
Vinnitsia National Technical University	Ukraine
Ivano-Frankivsk National Technical University of Oil and Gas	Ukraine
Kharkiv National University of Radio Electronics	Ukraine
Ukrainian National Forestry University	Ukraine
National Technical University "Kharkiv Polytechnic Institute"	Ukraine
Telenor	Norway
"Carte Blanche" Magazine	Ukraine

The official language of the IDDM Workshop was English. The workshop took place in the form of oral and poster presentations by invited keynote speakers and presenters of peer-reviewed papers.

The Organizing Committee has received 79 submissions, and 30 out of them were accepted for presentation as a regular paper. These papers are published in this Volume I of DCSMart 2019 proceedings.

Doubtless, the workshop wouldn't have taken place without the support of many people. First of all, we would like to thank our partners from the Ukrainian Regional Chapter of the International Neural Network Society, SIGMA Software and Public organization "Ukrainian scientific and educational IT society". Furthermore, we would like to thank the Honorary and Programme Chairs, Programme and Organizing Committees, external reviewers and designer team for their excellent work. We sincerely wish that all attendees benefited scientifically from the workshop and wish them every success in their future research.

December, 2019

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