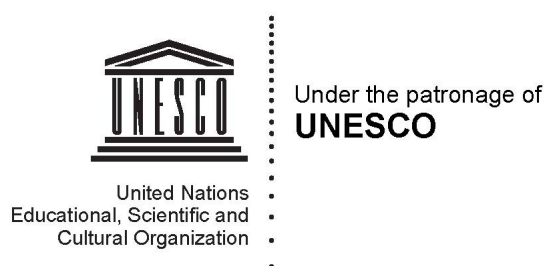


**Desislava Paneva-Marinova
Radoslav Pavlov Peter Stanchev**

Editors



**Digital Presentation and Preservation of
Cultural and Scientific Heritage**

International Conference

Burgas, Bulgaria

September 27–29, 2018

Proceedings

Volume VIII

Institute of Mathematics and Informatics – BAS

Sofia, 2018

Proceedings of the Eighth International Conference *Digital Presentation and Preservation of Cultural and Scientific Heritage – DiPP2018*, Burgas, Bulgaria, September 27–29, 2018 (Volume VIII)

Desislava Paneva-Marinova, Peter Stanchev, Radoslav Pavlov
Editors

Detelin Luchev
Copy Editor

Lubomil Draganov
Cover Design

This work is subject to copyright.

Permission to make digital or hard copies of portions of this work for personal or classroom use is granted without fee, provided that the copies are not made or distributed for profit or commercial advantage and that the copies bear this notice and the full citation on the first page. Copyright for components of this work owned by others must be honoured. Abstracting with credit is permitted. To otherwise reproduce or transmit in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage retrieval system or in any other way requires written permission from the publisher.

ISSN: 1314-4006
eISSN: 2535-0366

© **Editors, authors of papers, 2018**

Published by Institute of Mathematics and Informatics – BAS
Printed in Bulgaria by Fastumprint Ltd.
Sofia, 2018

Eighth International Conference Digital Presentation and Preservation of Cultural and Scientific Heritage DiPP2018

Burgas, Bulgaria
September 27–29, 2018

Conference Objective

The Eighth International Conference on *Digital Presentation and Preservation of Cultural and Scientific Heritage—DiPP2018* aims at presenting innovative results, research projects and applications in the field of digitisation, documentation, archiving, representation and preservation of global and national tangible and intangible cultural and scientific heritage. The focus is on providing open access to digitised cultural heritage and setting up sustainable policies for its continuous digital preservation and conservation. The priority area is the digital presentation and preservation of cultural and historical objects under conditions of risk, including those from the Burgas region. The forum will demonstrate innovative technologies and proto-types which result from established practices and achievements in the field. Representatives from a number of public and specialised libraries, museums, galleries, archives, centres, and national as well as foreign research institutions and universities will be invited to participate and exchange experiences, ideas, knowledge and best practices of the field.

The principal organiser of the conference is the *Institute of Mathematics and Informatics, Bulgarian Academy of Sciences*. Co-organisers are Regional Academic Centre—Burgas, Bulgarian Academy of Sciences, Regional Historical Museum—Burgas, Burgas Free University, and Index Ltd. The event is supported by the *National Scientific Fund* (Contract No. ДПМНФ 01/22 27.08.2018) and is under the patronage of *UNESCO* and the *Burgas District Administration*.

Accompanying Events

- Workshop and national information day *Open Access to Scientific Publications, Data and Data Science*, organised by the Institute of Mathematics and Informatics, Bulgarian Academy of Sciences;
- One-day Symposium on *Future Trends in Serious Games for Cultural Heritage*, organized in the frame of the Joint research project *Development of Software Systems for Multimedia and Language Technologies* between Institute of Mathematics and Informatics, Bulgarian Academy of Sciences (IMI-BAS) and Computer and Automation Research Institute (SZTAKI), Hungarian Academy of Sciences, Chairs: Radoslav Pavlov and János Demetrovic, Secretaries: Desislava Paneva-Marinova and Zsolt László Márkus.

Editorial Board (Programme Committee)

Peter Stanchev, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria; Kettering University, Flint, Michigan, USA (Co-chair, Editor)

Radoslav Pavlov, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria (Co-chair, Editor)

Desislava Paneva-Marinova, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria (Conference Secretary, Editor)

Detelin Luchev, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria (Conference Secretary)

Antonella Fresa, Promoter S.R.I., Italy

Bhanu Neupane, UNESCO, France

Carlo Megini, Information Science and Technology Institute, National Research Council of Italy, Italy

Danail Dochev, Institute of Information and Communication Technologies, Bulgarian Academy of Sciences, Bulgaria

Dimitris Kotzinos, Université de Cergy-Pontoise, Equipes Traitement de l'Information et Systèmes, France

Dominique Laurent, Université de Cergy-Pontoise, France

Evgenia Nikolova, Burgas Free University, Bulgaria

Fausto Rabitti, Information Science and Technology Institute, National Research Council of Italy, Italy

Galia Hristozova, Burgas Free University, Bulgaria

Galina Bogdanova, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria

Giuseppe Amato, Information Science and Technology Institute, National Research Council of Italy, Italy

Kilian Stoffel, Information Management Institute, University of Neuchâtel, Switzerland

Krasen Stefanov, Faculty of Mathematics and Informatics, Sofia University, Bulgaria

Magdalena Stoyanova, CISBI-Università Ca' Foscari, Venezia, Italy

Maja Leszczyńska, Wrocław University of Economics, Poland

Maria Monova-Zheleva, Burgas Free University, Bulgaria

Mirjana Ivanovic, Department of Mathematics and Informatics, University of Novi Sad Faculty of Sciences, Serbia

Nicolas Spyratos, University of Paris-South and Laboratory for Research in Informatics, France / Institute of Computer Science of the Foundation for Research and Technology - Hellas, Greece

Sevdalina Turmanova, Burgas Assen Zlatarov University, Regional Academic Center - Burgas, Bulgarian Academy of Sciences

Slavian Radev, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria

Stavros Christodoulakis, TUC-MUSIC Laboratory, Electronic and Computer Engineering Department, Technical University of Crete, Greece

Svetla Baykoucheva, University of Maryland, USA

Qin Fei, University of Chinese Academic of Sciences, Chinese Academic of Sciences, China

Veselina Zhecheva, Burgas Free University, Bulgaria

Vito Cappellini, Faculty of Engineering, Florence University, Italy

Local Organizing Committee

Milen Baltov, Burgas Free University, Bulgaria

Yanislav Zhelev, Burgas Free University, Bulgaria

Radovesta Stewart, Regional Historical Museum, Burgas, Bulgaria



United Nations
Educational, Scientific and
Cultural Organization

Organisation
des Nations Unies
pour l'éducation,
la science et la culture

Organización
de las Naciones Unidas
para la Educación,
la Ciencia y la Cultura

Организация
Объединённых Наций по
вопросам образования,
науки и культуры

منظمة الأمم المتحدة
للترية والعلم والثقافة

联合国教育、
科学及文化组织

The Director-General

Prof. Peter L. Stanchev
Bulgarian Academy of Sciences
8 G. Bonchev Str.
1113, Sofia
Bulgaria

24 OCT 2017

Ref.: DG/5/17/8608

Dear Professor Stanchev,

I wish to thank you for your letter of 3 October 2017, by which you request UNESCO's support for the eighth International conference on Digital Presentation and Preservation of Cultural and Scientific Heritage that will take place in Burgas from 27 to 29 September 2018.

UNESCO wishes to congratulate the organizers of this event, which is geared towards promoting the unrestricted dissemination of scientific knowledge. I am confident that the conference will stimulate discussion on a range of issues related to Open Access to scientific information, and will complement UNESCO's work in this area.

In light of the above, I am pleased to grant UNESCO's patronage to this event, and to authorize the use of the Organization's logo, in accordance with the enclosed General Conditions.

I wish you every success for this event and would appreciate for providing us with a copy of its final report on its outcomes in due course.

Respectfully,

Yours sincerely,
Irina Bokova
Irina Bokova

Enc.