

**Radoslav Pavlov**

**Peter Stanchev**

**Editors**

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

**International Conference**

Veliko Tarnovo, Bulgaria

September 18–21, 2012

**Proceedings**

**Institute of Mathematics and Informatics – BAS, Sofia, 2012**

**Radoslav Pavlov, Peter Stanchev (Eds)**

**Desislava Paneva-Marinova**

Copy Editor

**Lilia Pavlova, 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 honored. 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**

**© Editors, authors of papers, 2012**

**Published by Institute of Mathematics and Informatics – BAS**

**Printed in Bulgaria by Demetra Ltd.**

**Sofia, 2012**

# **2nd International Conference DiPP2012 Digital Presentation and Preservation of Cultural and Scientific Heritage**

Veliko Tarnovo, Bulgaria  
September 18–21, 2012

## **Conference Objective**

The 2<sup>nd</sup> International Conference on *Digital Presentation and Preservation of Cultural and Scientific Heritage – DiPP2012* aims at presenting innovations, 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 main focus is to provide open access to digitised cultural heritage and to set up sustainable policies for its continuous digital preservation and conservation. A priority area is the digital presentation and preservation of cultural and historical objects under conditions of risk. The forum demonstrates innovative technologies and prototypes, including digital repositories, digital archives, virtual museums and digital libraries, which result from established practices and achievements in the field.

## **Honorary Chairmen**

**Prof. Stefan Dodunekov**, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria

**Prof. Stoyan Denchev**, University of Library Studies and Information Technologies, Bulgaria

**Prof. Plamen Legkostup**, St Cyril and St Methodius University of Veliko Tarnovo, Bulgaria

## **Programme Committee**

**Radoslav Pavlov**, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria (Editor)

**Peter Stanchev**, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria (Editor)

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

**Balázs Wagner**, Computer and Automation Research Institute, Hungarian Academy of Sciences, Hungary

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

**Dimiter Minev**, Public Library “Ivan Vazov“, Plovdiv, Bulgaria

**Emilia Staneva-Milkova**, Public Library “Pencho Slaveykov”, Varna, Bulgaria

**Georgi Todorov**, St Cyril and St Methodius University of Veliko Tarnovo, Bulgaria

**Ivan Aleksandrov**, Regional Public Library “P. R. Slaveykov”, Veliko Tarnovo, Bulgaria

**Ivan Tsarov**, Regional Museum of History of Veliko Tarnovo, Bulgaria

**Jiri Rakosnik**, Institute of Mathematics, Academy of Sciences, Czech Republic

**José Borbinha**, Computer Science and Engineering Department, Instituto Superior Técnico, Portugal

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

**Krasen Stefanov**, Sofia University, Bulgaria

**Milena Dobрева**, Faculty of Media and Knowledge Sciences, University of Malta

**Nicolas Spyrtos**, University of Paris-South and Laboratory for Research in Informatics, France

**Norbert Lossau**, Niedersächsische Staats- und Universitätsbibliothek/Goettingen State and University Library, Germany

**Panos Constantopoulos**, Dept. of Informatics, Athens University of Economics and Business, Greece

**Peretz Shoval**, Ben-Gurion University of Negev, Israel

**Peter Stockinger**, Institut National des Langues et Civilisations Orientales, Fondation Maison des Sciences de l'Homme, France

**Petko Petkov**, St Cyril and St Methodius University of Veliko Tarnovo, Bulgaria

**Phillip Ein-Dor**, Academic College of Tel-Aviv—Yaffo, Israel

**Roumen Nikolov**, University of Library Studies and Information Technologies, Bulgaria

**Valeria Fol**, University of Library Studies and Information Technologies, Bulgaria

**Vladimir Aleksiev**, Ontotext, Bulgaria

**Yuri Berezkin**, Peter the Great's Museum of Anthropology and Ethnography (Kunstkamera), Russian Academy of Sciences, Russian Federation

**Zsolt Márkus**, Computer and Automation Research Institute, Hungarian Academy of Sciences, Hungary

**Radoslav Pavlov, Peter Stanchev (Eds)**

**Desislava Paneva-Marinova**

Copy Editor

**Lilia Pavlova, 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 honored. 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**

**© Editors, authors of papers, 2012**

**Published by Institute of Mathematics and Informatics – BAS**

**Printed in Bulgaria by Demetra Ltd.**

**Sofia, 2012**

# **2nd International Conference DiPP2012 Digital Presentation and Preservation of Cultural and Scientific Heritage**

Veliko Tarnovo, Bulgaria  
September 18–21, 2012

## **Conference Objective**

The 2<sup>nd</sup> International Conference on *Digital Presentation and Preservation of Cultural and Scientific Heritage – DiPP2012* aims at presenting innovations, 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 main focus is to provide open access to digitised cultural heritage and to set up sustainable policies for its continuous digital preservation and conservation. A priority area is the digital presentation and preservation of cultural and historical objects under conditions of risk. The forum demonstrates innovative technologies and prototypes, including digital repositories, digital archives, virtual museums and digital libraries, which result from established practices and achievements in the field.

## **Honorary Chairmen**

**Prof. Stefan Dodunekov**, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria

**Prof. Stoyan Denchev**, University of Library Studies and Information Technologies, Bulgaria

**Prof. Plamen Legkostup**, St Cyril and St Methodius University of Veliko Tarnovo, Bulgaria

## **Programme Committee**

**Radoslav Pavlov**, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria (Editor)

**Peter Stanchev**, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria (Editor)

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

**Balázs Wagner**, Computer and Automation Research Institute, Hungarian Academy of Sciences, Hungary

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

**Dimiter Minev**, Public Library “Ivan Vazov“, Plovdiv, Bulgaria

**Emilia Staneva-Milkova**, Public Library “Pencho Slaveykov”, Varna, Bulgaria

**Georgi Todorov**, St Cyril and St Methodius University of Veliko Tarnovo, Bulgaria

**Ivan Aleksandrov**, Regional Public Library “P. R. Slaveykov”, Veliko Tarnovo, Bulgaria

**Ivan Tsarov**, Regional Museum of History of Veliko Tarnovo, Bulgaria

**Jiri Rakosnik**, Institute of Mathematics, Academy of Sciences, Czech Republic

**José Borbinha**, Computer Science and Engineering Department, Instituto Superior Técnico, Portugal

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

**Krasen Stefanov**, Sofia University, Bulgaria

**Milena Dobрева**, Faculty of Media and Knowledge Sciences, University of Malta

**Nicolas Spyrtos**, University of Paris-South and Laboratory for Research in Informatics, France

**Norbert Lossau**, Niedersächsische Staats- und Universitätsbibliothek/Goettingen State and University Library, Germany

**Panos Constantopoulos**, Dept. of Informatics, Athens University of Economics and Business, Greece

**Peretz Shoval**, Ben-Gurion University of Negev, Israel

**Peter Stockinger**, Institut National des Langues et Civilisations Orientales, Fondation Maison des Sciences de l'Homme, France

**Petko Petkov**, St Cyril and St Methodius University of Veliko Tarnovo, Bulgaria

**Phillip Ein-Dor**, Academic College of Tel-Aviv—Yaffo, Israel

**Roumen Nikolov**, University of Library Studies and Information Technologies, Bulgaria

**Valeria Fol**, University of Library Studies and Information Technologies, Bulgaria

**Vladimir Aleksiev**, Ontotext, Bulgaria

**Yuri Berezkin**, Peter the Great's Museum of Anthropology and Ethnography (Kunstkamera), Russian Academy of Sciences, Russian Federation

**Zsolt Márkus**, Computer and Automation Research Institute, Hungarian Academy of Sciences, Hungary

## Preface

The main aim of the 2<sup>nd</sup> International Conference *Digital Presentation and Preservation of Cultural and Scientific Heritage (DiPP2012)* is to bring together as many interested institutions/parties as possible working on the digitization, recording, documenting, archiving, presenting, protecting and managing cultural and scientific heritage, so that they can share their advanced thoughts, know-how and experience. The main focus is on environments providing open access to digitized heritage. Public and specialized libraries, museums, galleries, archives, community centres, research institutions and universities are expected to gain and exchange knowledge, skills, and expertise from the event.

The principal organizer of the conference is the *Institute of Mathematics and Informatics, Bulgarian Academy of Sciences*. Co-organizers are the *University of Library Studies and Information Technologies (Sofia)* and the *St Cyril and St Methodius University of Veliko Tarnovo*. The event is hosted by the *Regional Museum of History* and the *Public Library "P. R. Slaveykov"*, Veliko Tarnovo.

A tutorial on *Computing: Technological Advances, Social Implications, Ethical and Legal Issues* is given by Narayan C. Debnath, PhD, DSc, professor and chairman of the Department of Computer Science, Winona State University, USA, and president of the International Society for Computers and Their Applications (ISCA). The tutorial presents a broad overview on the scientific foundations, technological advances, social implications, and ethical and legal issues related to computing.

Four types of papers are presented – invited papers, full papers, short papers and project papers. The first three types discuss current scientific results, trends and achievements in the field of digital preservation and presentation of cultural and scientific heritage. The project papers present developments in progress, part of them experimental, and made by memory institutions during their institutional projects.

- *Invited papers*

The paper by E. Bárd and Z. Márkus presents the opportunities for applying QR codes for museums and exhibits through the example of the Hungarian Museum of Environmental Protection and Water Management (Esztergom, Hungary).

B. Bonchev's paper reviews the evolution of the Europeana metadata standard used for building the Semantic Web and enabling integrated access to regional digital libraries.

V. Alexiev's paper previews types and annotations for CIDOC Conceptual Reference Model Properties.

The paper by G. Bogdanova and R. Pavlov reviews the software developments for digital presentation and preservation of Bulgarian folklore treasure created within the project "Knowledge Technologies for Creation of Digital Presentation and Significant Repositories of Folklore Heritage" by teams of the Institute of Mathematics and Informatics.



The paper by J. Rakosnik, P. Stanchev, G. Simeonov and R. Pavlov presents in brief the Bulgarian Digital Mathematical Library BulDML and the Czech Digital Mathematical Library DML-CZ. Both libraries use the open source software DSpace and both are partners in the European Digital Mathematics Library EuDML.

- *Full papers*

The paper by K. Ivanova, I. Mitov, P. Stanchev, Ph. Ein-Dor, K. Vanhoof presents one approach for extending the learning set of a classification algorithm with additional metadata, which is used as a base for giving appropriate names to regularities found.

D. Paneva-Marinova's paper discusses a different vision for personalization of the user's stay in a cultural heritage digital library that models services for personalized content marking, commenting and analyzing that doesn't require strict user profile, but aims at adjusting to the user's individual needs.

M. Damova's paper presents Bulgariana, the Bulgarian chapter of Europeana. It is part of the technical infrastructure of Europeana, an established technical aggregator of Bulgarian cultural heritage content.

The main focus of attention in T. Stefanov and M. Stefanova's paper is the access to websites of leading regional, national and world museums. Their accessibility from desktop and mobile devices is evaluated.

The paper by N. Vladimirova deals with digitization as a method of protecting and preserving the cultural and historical heritage of Armenians in Bulgaria.

The purpose of I. Yankova, R. Vasileva, S. Stancheva's paper is to evaluate the effectiveness of learning by doing as a practical tool for managing the training of students in Library Management at SULSIT, Sofia, Bulgaria.

The purpose of T. Trencheva, T. Todorova and I. Trenchev's paper is to introduce Digital Rights Management (DRM) and its implications for content producers, consumers, and libraries.

The paper by L. Dimitrova and R. Garabík briefly reviews the bilingual Slovak-Bulgarian/Bulgarian-Slovak parallel and aligned corpus. The corpus is collected and developed as a result of the collaboration in the framework of the joint research project between the Institute of Mathematics and Informatics – BAS and the Ľ. Štúr Institute of Linguistics – SAS.

The paper by R. Dutsova aims to represent a bilingual online dictionary as a useful tool helping the preservation of natural languages. The author focuses on the approach that was taken to developing a compatible bilingual lexical database for the Bulgarian-Polish online dictionary.

- *Short papers*

The paper by G. Bogdanova, T. Todorov, N. Noev and S. Kancheva presents the first attempt for a computational linguistic explanation of the bell knowledge delivering its semantic representation.

G. Bogdanova, K. Stoffel, T. Todorov and N. Noev's paper describes an ontological model of data in an archive containing a detailed description of church bells.

The paper by O. Konstantinov, E. Kovatcheva, V. Fol and R. Nikolov examines the different practices and opportunities for digitization of cultural artifacts with historical significance. It describes the work on a pilot project concerning the development of e-learning materials in the Thracian cultural and historical heritage.

The paper by K. Rangochev, M. Dimitrova and D. Paneva-Marinova discusses the variety of the digitized content of an electronic encyclopedia on the veneration of saints according to Bulgarian sources. The emphasis is on medieval Slavonic Church manuscripts and on present-day records of Bulgarian folklore narratives and songs.

The emphasis of A. Gimisheva and V. Ruseva's paper is placed on the digital collection "Bulgarian Cultural Heritage Materials" as an example of a focused digitization at the New Bulgarian University.

G. Nazarska's paper describes the creation and the content of the digital archive of photographs, films and materials from fieldwork by students from the Information Funds of the Cultural and Historical Heritage programme at the SULSIT, Sofia, Bulgaria.

The paper by M. Todorova, V. Tzonkova and N. Byanova emphasizes using the computer simulation tool for increasing the attractiveness of teaching and learning in economics.

The paper by L. Pavlova-Draganova, D. Luchev and M. Goynov describes a project of a multimedia digital library for fashion objects. The presented work aims to provide a working environment for students of the National Art Academy, showing the significant values of the fashion domain before a professional and a non-professional public.

The paper by P. Stanchev presents in brief the "Open Access Infrastructure for Research in Europe" project and what is done in Bulgaria in the area of open access to scientific information.

- *Project papers*

The paper by Z. Zlatanov, M. Blagoev and I. Nikoevska reviews the results of a project for digital preservation and dissemination of cultural heritage by 3D laser scanning.

D. Atanassova-Pencheva's paper introduces the ideas and aims of the Hagiotheca Preslavica project – Reconstruction of the Preslav hagiographical collections.

D. Minev's paper recounts the first coordinated attempts of the Ivan Vazov Public Library – Plovdiv at digitizing some of its treasured collections such as manuscripts, early printed books and archives through partner projects and revealing them to the world community.

The paper by P. Sabev presents the work done by the Regional History Museum – Veliko Tarnovo on 3D reconstruction of cultural values and objects from the Veliko Tarnovo region.

The digitization practice for retro-converting of mathematical periodicals published by IMI-BAS and the followed benefits for long-term preserving and assuring open

access to these materials is discussed in the article by V. Grigorova, K. Sotirova, V. Naoumova, A. Sameva, M. Dobрева, K. Ivanova and P. Stanchev.

M. Karadecheva presents two papers. The first describes the project “Moving boundary”, a virtual museum of ethnic groups in Bulgaria. The second presents an online catalogue of relics of the Unification of Bulgaria in 1885.

A. Krandeva’s paper describes radio archives and repositories of the Bulgarian National Radio as cultural heritage. It also presents their practical use as integrated resources on different radio platforms.

Veliko Tarnovo, 18 September 2012

Radoslav Pavlov Peter Stanchev  
Editors

## **IN MEMORIAM**

**Prof. Stefan Dodunekov**  
**President of the Bulgarian Academy of Sciences**  
**(1945–2012)**



On 5 August 2012 the DIPP2012 Programme Committee was bereaved of its Honorary Chairman. The grave loss is shared by the entire international community of workers in digital presentation and preservation of cultural and scientific heritage, in which he was a pioneer and leader. It is our professional and human duty to live up to the expectations that he had for the advancement of our field.

The DIPP2012 Programme Committee