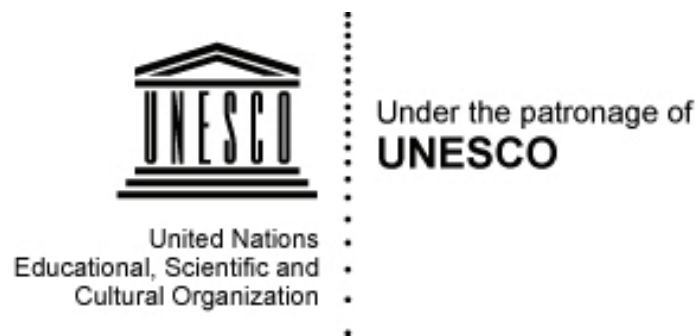


Radoslav Pavlov

Peter Stanchev

Editors



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

Veliko Tarnovo, Bulgaria

September 28–30, 2015

Proceedings

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Proceedings of the Fifth International Conference *Digital Presentation and Preservation of Cultural and Scientific Heritage – DiPP2015*, Veliko Tarnovo, Bulgaria, September 28–30, 2015 (Volume V)

Radoslav Pavlov, Peter Stanchev
Editors

Detelin Luchev
Copy Editor

Lubomil Draganov
Cover Design

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Fifth International Conference Digital Presentation and Preservation of Cultural and Scientific Heritage DiPP2015

Veliko Tarnovo, Bulgaria
September 28–30, 2015

Conference Objective

The Fifth International Conference on *Digital Presentation and Preservation of Cultural and Scientific Heritage—DiPP2015* 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 main focus is to provide open access to digitised cultural heritage and to set 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 Veliko Tarnovo region. The forum will demonstrate innovative technologies and proto-types which result from established practices and achievements in the field. Representatives will be invited to participate and exchange experiences, ideas, knowledge and best practices of the field from a number of public and specialised libraries, museums, galleries, archives, centres, and national as well as foreign research institutions and universities.

The principal organiser of the conference is the *Institute of Mathematics and Informatics, Bulgarian Academy of Sciences (IMI-BAS)*. Co-organisers are *Veliko Turnovo Municipality*, the *Regional Museum of History*, the *P. R. Slaveykov Public Library (Veliko Tarnovo)* and the *St Cyril and St Methodius University of Veliko Tarnovo*. The event is hosted by the *Regional Museum of History* and the *P. R. Slaveykov Public Library (Veliko Tarnovo)*. DiPP2015 is supported by the **Ministry of Education and Science** and is under the patronage of *UNESCO*.

Accompanying Events

- Workshop and National information day *Open Access to Scientific Publications and Data*, organised by the Institute of Mathematics and Informatics, Bulgarian Academy of Sciences;
- Workshop *Innovations and Culture – Regional Problems and Solutions*, organised by the Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, and the P. R. Slaveykov Public Library (Veliko Tarnovo).

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Preface

The main aim of the Fifth International Conference *Digital Presentation and Preservation of Cultural and Scientific Heritage (DiPP2015)* is to bring together as many interested institutions as possible working on the digitisation, recording, documenting, archiving, presenting, protecting and managing cultural and scientific heritage, so that they can share their advanced thoughts, know-how and experience. Public and specialised libraries, museums, galleries, archives, community centres, research institutions and universities are expected to share and acquire knowledge, skills, and expertise from the event.

Five types of papers are presented—invited papers, full papers, short papers, project papers and demos. 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 C. Thanos addresses the technological dimension of data reusability: the scientific data universe, the impediments of data (re)reuse; the data publication process as a bridge between data author and user and the relevant technologies enabling this process.

A. Fresa and Cl. Prandoni's paper presents the work that is being carried out in two EU-funded projects: DCH-RP (Digital Cultural Heritage – Roadmap for Preservation) and PREFORMA (PREservation FORMAts for culture information/e-archives). The understanding of digital preservation requires consideration of two main aspects: organisation and technology.

B. Bontchev's paper discusses video games as a modern tool for presenting cultural heritage by integrating art, storytelling and digital technology. It focuses on both entertainment games and serious games for cultural heritage and provides some illustrative examples of such games with discussing their approach and novelty.

The paper by M. Dimiccoli and P. Radeva gives an overview on the emerging trend of digitized self, focusing on visual lifelogging through wearable cameras. This is about continuously recording our life from a first-person view by wearing a camera that passively captures images.

P. Stanchev, J. Rákosník, R. Pavlov and G. Simeonov's paper gives an overview of the current development of tools for search for mathematical formulae and their implementation in Digital Mathematical Libraries and reference databases such as zbMATH, MathSciNet and EuDML for mathematical scholarly literature.

The paper by R. Petrauskaitė presents *Lituanistika*, a multifunctional, multilingual interdisciplinary (within the scope of social sciences and humanities) and international database in the area of Lithuanian studies. It also deals with the issue of multifunctionality and tackles the question of the compatibility of the database's various aims.

Important blocks of the existing Open Access research infrastructure are described in J. Stojanovski's paper: the Croatian Scientific Bibliography CROSBIB, the Croatian portal for Open Access journals HRČAK, and the common infrastructure for digital academic repositories DABAR. The future development of Open Access infrastructure in Croatia is discussed.

- *Full papers*

I. Ivanov, C. Hantova, M. Nisheva, P. Stanchev and P. Ein-Dor's paper reviews some methods for text authorship attribution and discusses the development of a software library with tools for automatic authorship attribution. The focus is on an analysis of two groups of tools oriented towards methods for extraction of features and for computing the distance between character strings based on data compression algorithms.

F. Banterle, F. A. Cardillo, L. Malomo, P. Pingi, F. Gabellone, G. Amato and R. Scopigno's paper is a case study on the use of augmented reality (AR) within the context of cultural heritage. They implemented an iOS app for markerless AR that will be exhibited at the MUST museum in Lecce, Italy. The app shows a rich 3D reconstruction of the Roman amphitheater, which is nowadays only partially visible.

Zs. L. Márkus, G. Kaposi, T. Szkaliczki, D. Luchev and R. Pavlov's paper explains the newest developments in integrating the Bulgarian Iconographical Digital Library and the tourist mobile application family GUIDE@HAND. This year, a new stand-alone offline mobile application (BOOK@HAND) was created. The main novelty of the application is the option to present collections in a virtual exhibition room by using panorama pictures in off-line mode.

M. Stošić and R. Stanković's paper describes an Android application which allows computation of the physical area of a selected region on the image. The System is intended for helping archaeologists on the fields and archaeological sites. The major advantage of the system is having resolved the problem of computation the area of the damaged part of the mosaics on field.

D. Tatić, D. B. Gajić and R. S. Stanković discuss a system that they developed to enable an improved presentation of some of the most famous cultural monuments in Niš using QR codes. The system allows to easily add interactive content for cultural and historical objects in the form of text, images, sounds or 3D models. These contents can be accessed by using QR codes.

In easel painting (icons) mapping the status of conservation (MCS) is a complex process of prospecting in various spectral, graphic, and spatial techniques, integral analysis and "technical" visualizations of the data. M. Stoyanova and T. Lukić show the results of a multi-methodological survey applied towards detecting sharp discontinuities (boundary of cavities, wrinkles and fractures in the host medium).

The paper by R. Stewart, M. Zheleva-Monova, Y. Zhelev, L. Pavlova, D. Luchev, D. Paneva-Marinova and R. Pavlov presents the developed Digital Library of Regional Historical Museum – Burgas "Virtual collection of Icons" and describes a methodology for evaluation the need of introducing this innovation in RHM-Burgas, the innovative solution's degree of viability and the economic impact.

K. Rangochev, M Goynov and D. Radoslavova's article offers an annual report on the activities of the users of the electronic Encyclopaedia Slavica Sanctorum, an online multimedia digital library of Bulgarian written, oral, and visual materials concerning the Orthodox Christian calendar and sainthood.

R. Dutsova's paper focuses on a web-based software system for presentation, processing and management of Bulgarian language resources as a part of the Bulgarian cultural heritage. It allows open access through the global network to well-structured digital language data—bilingual dictionaries and parallel corpora.

I. Derzhanski and O. Siruk examine the occurrences and correspondences of terms for blood kinship in a Bulgarian–Ukrainian parallel corpus of fiction. All instances of the terms selected for study, matching and non-matching, are located and counted, and the frequencies compared.

Managing the ever growing production of mathematical research literature requires specific tools. L. Havlíčková describes important features and functions of zbMATH and presents the practical experience and the workflow used by the Prague Editorial Unit which contributes to creation and maintenance of zbMATH.

The paper by Zs. L. Márkus, G. Kaposi, G. Szántó, T. Szkaliczki, M. Veres, Zs. Weisz, W. Routsalainen, D. Luchev and R. Pavlov presents an offline mobile application (INFO@HAND) providing information about the DIPP conference series for conference participants and scientists interested in the conference scope and topics.

F. Zhao and S. C. Loy's paper discusses the importance of engaging 3D scanning technology to preserve China's cultural properties, and shares the experience of the Amber Digital Solutions Company on using 3D data technology in cultural exchanges, restoration programmes and interactive presentations during exhibitions.

The mobile digital museum built by the Inner Mongolia Museum has been in operation for a period of two years. During this time, it has received overwhelming responses from all age groups of audiences and all walks of life. L. Ta, F. Zhao and S. C. Loy's paper documents the process of building China's first entirely mobile digital museum (with no physical artefacts) and share the experience and achievements.

J. E. F. Zhao and S. C. Loy's paper analyses the critical issues faced by the Gansu Provincial Museum in attracting and maintaining its audiences, and how it engages digital technology to create new compelling exhibits via the use of both digital and multimedia tools. Real life examples using virtual reality, augmented reality and interactive games are briefly discussed.

- *Short papers*

N. D. Savić, D. B. Gajić and R. S. Stanković's paper discusses an implementation of a multimedia projection system with two synchronized video sources, based on the Raspberry Pi single-board computer systems. The system is primarily intended for various projections in presentation of historical and cultural heritage, although it can be used for many other related purposes.

The paper by M. Radmanović presents one solution for implementing 3D sound effects for auditory illusions immersive experiences in museums using the Raspberry Pi mini-computer and home theatre system with 5.1 surround sound. With this solution it

is possible to create a museum visitor detector via Raspberry Pi that uses motion detection to trigger 3D sound playing on home theatre system.

V. Georgiev's paper describes a set of tools developed for adding visualization of 3D content to new and existing web pages, which can be used by authors with various expertise and skills.

The paper by L. Draganov, D. Paneva-Marinova, L. Pavlova, D. Luchev, Zs. L. Márkus, G. Szántó and T. Szkaliczki proposes an approach for technology-enhanced learning, combining analysis, collaborative work, mobile learning (m-learning for short), discussion, and learning-by-authoring approaches in order to achieve more active participation of the learners during the reception of knowledge and to stimulate their creative thinking.

S. Bozov and E. Zaharieva-Stoyanova's paper views problems related to the development of knitting software for handmade knitting. The paper introduces an XML-based approach which allows simulating limitations due to the knitting technology.

- *Project papers*

A. Krandeva's paper describes some of the issues of web archiving. The preparing of the Bulgarian National Radio web site for web archiving is discussed.

The paper by M. Stoyanova, D. Luchev, L. Pavlova and I. Provorova focuses on the integration and comparing of the significant increase in the quantity and quality of image-based data resulting from rapid technological advancement in recent years, and the translation of interdisciplinary to schematic or image-based data and the standardization of dictionaries used to enable their sharing.

E. Mitreva and V. Georgiev's paper describes the latest improvements to a recently developed online environment for managing virtual collections of 3D objects. As part of that effort the authors introduced a document-oriented NoSQL layer for storing the data describing the 3D objects and collections provided by the MongoDB engine.

L. Pavlova and V. Sapundjiev's paper introduces the overall structure and a functional specification of an interactive environment for digital preservation and preservation of fashion objects connected with a digital data repository developed to serve the learning needs of students of the National Art Academy.

The paper by A. Lessenska and S. Aneva presents a standardised scheme for describing the whole Slavonic Manuscript Collection kept at the Plovdiv Public Library and its adaptation to the MARC 21 Format for Bibliographic Data. A template for cataloguing is introduced that has been tested on 58 fragments.

- *Demos*

S. Marlokov and M. Karadecheva's demo covers the concept of preserving our historical consciousness in the vast and never stopping world, attracting the attention of younger generations by creating a game connected to historical heritage sites.

The demo by A. Rych presents Piql Preservation Services ("Piql"), developed as a turnkey solution designed for secure, migration-free long-term preservation of digital

data. It sets an open standard for long-term preservation for the future, consisting of equipment and processes needed for writing and retrieving digital data.

Veliko Tarnovo, 28 September 2015

Radoslav Pavlov Peter Stanchev
Editors



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Educational, Scientific and
Cultural Organization

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The Director-General

Professor Peter L. Stanchev
Chair
Institute of Mathematics and
Informatics
Bulgarian Academy of Sciences
8 G. Bonchev Strasse
1113 Sofia
Republic of Bulgaria

11 May 2015

Ref.: DG/7/15/1118

Dear Professor Stanchev,

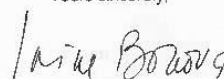
Thank you for your letter of 6 February last, by which you request support for the Fifth International Conference on Digital Preservation and Preservation of Cultural and Scientific Heritage that will take place in Plovdiv from 28 to 30 September 2015.

UNESCO is heartened by the efforts of the Bulgarian Academy of Sciences to bring together experts from across the world to discuss issues concerning digital preservation and the importance of safeguarding heritage. These deliberations also will add value to UNESCO's activities in these areas.

I am pleased, therefore, to grant the Organization's patronage to this event. Furthermore, I authorize the use of UNESCO's logo in accordance with the attached General Conditions. With regards to your request for financial support, I invite you to contact Bhanu Neupane, Programme Specialist in the Knowledge Societies Division within the Communication and Information Sector (tel.: +33145684365; e-mail: b.neupane@unesco.org), including to consider representation by UNESCO.

In ending, allow me to congratulate you for organizing a successful conference in 2014, and to express my hope that this year's event will be even more fruitful.

Yours sincerely,


Irina Bokova