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Editors



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

Veliko Tarnovo, Bulgaria

September 26–28, 2016

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Proceedings of the Sixth International Conference *Digital Presentation and Preservation of Cultural and Scientific Heritage – DiPP2016*, Veliko Tarnovo, Bulgaria, September 26–28, 2016 (Volume VI)

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Sixth International Conference Digital Presentation and Preservation of Cultural and Scientific Heritage DiPP2016

Veliko Tarnovo, Bulgaria
September 26–28, 2016

Conference Objective

The Sixth International Conference on *Digital Presentation and Preservation of Cultural and Scientific Heritage—DiPP2016* 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 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 Veliko Tarnovo 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 (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)*. DiPP2016 is supported by the *National Scientific Fund (Contract № ДПМНФ 01/8 – 11 Aug 2016)* 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 *Digital cultural heritage "North +": documenting, preserving and providing public access to the cultural heritage in libraries, museums, archives and galleries in North and Central Bulgaria*, 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 Sixth International Conference *Digital Presentation and Preservation of Cultural and Scientific Heritage (DiPP2016)* is to bring together as many interested institutions as possible working on digitising, 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 N. Manola presents the key characteristics of a sustainable open science e-Infrastructure as gained from six years of operation of OpenAIRE, a key EU e-Infrastructure on scholarly communication.

J. Rákosník, P. Stanchev and R Pavlov's paper presents the current state and future plans of European Digital Mathematics Library EuDML. EuDML makes mathematical literature available online in the form of an enduring digital collection, developed and maintained by a network of institutions.

P. Constantopoulos' paper reviews the use of digital curation and curation-aware repository systems in the cultural heritage domain; achieving semantic interoperability through ontologies; explicitly addressing contextual issues of information on cultural heritage and humanities; and the services of digital research infrastructures.

The paper by G. Senka gives an overview on several successful projects, which can be taken as a basis and best practice tools for a further digitization process, where the main challenges are copyright issues, technological follow-up and development of user-attractive digital products for all audiences, particularly the educational and science sector.

K. Stefanov, B. Bontchev, P. Boytchev, A. Georgiev and A. Grigorov's paper presents the RAGE project's asset model and asset metadata model, highlighting key issues and challenges in constructing RAGE assets and using an asset metadata model with a flexible metadata editor, facilitating both the adaptation and the improvement of the asset metadata model.

- *Full papers*

M. Nisheva, P. Pavlov and P. Stanchev's paper analyses the main aspects of semantic search and the corresponding features of some popular semantic search systems. The presentation is focused on a discussion of the implementation of a successful project in building a modern semantic search engine.

The paper by Z. L. Márkus, G. Kaposi, M. Veres, T. Szkaliczki, D. Luchev and D. Paneva-Marinova introduces BOOK@HAND Bells – a standalone offline mobile application for mobile presentation of Bulgarian bells, as the newest developments in the GUIDE@HAND mobile application family.

J. Nagy, Z. L. Márkus, G. Kaposi, G. Szántó, T. Szkaliczki and Norbert Vass present how the VR technology helps tourists in selecting their destinations. The current state-of-the-art service is a result of systematic development activities which has become available in the tourist information office (Tourinform) in the town of Miskolc.

F. Zhao and S. Ch. Loy's paper discusses how 3D digitization of cultural properties and modern interactive methods can help museums disseminate, educate and share the rich history, culture and civilization of in museums' collections more effectively than traditional methods, which used visual boards.

R.-M. Ion, S. Teodorescu, I. A. Bucurică, M.-L. Ion and D. Turcanu-Caruțiu's paper discusses the new technologies, such as the non-destructive diagnosis technologies, for the safe conservation of historic, cultural and architectural monuments and practical solutions applied for Basarabi churches.

B. Shishkov proposes in his paper an approach based on Service-Oriented Computing and Organizational Semiotics, directed to Cultural Heritage digitization. The approach is partially illustrated by means of an example.

K. Angelov's paper describes the current state of digital preservation of Cultural Heritage with an accent on data integration and performance optimization of processes. The author shows his vision for further solutions for automated optimization of resource utilization in ETL jobs cutting development costs.

The paper by M. Goynov, K. Rangochev, D. Paneva-Marinova, V. Sapunjiev presents an analysis of the usage of the interoperability service, compiling content from two digital libraries for Orthodox art and knowledge—the Encyclopaedia Slavica Sanctorum and the Bulgarian Iconographical Digital Library.

The evaluation of the problems encountered by non-contact characterization of natural dyestuffs (NDs) reported by M. Stoyanova, D. Luchev and D. Paneva-Marinova demonstrates that practically no single analytical method – destructive, less so, or not at all – can warrant absolute reliability of the results. For to overwhelm the drawbacks and optimize accuracy of NDs characterization, the authors propose the integration of chemio-physical and computational assessment.

The paper by R. Dutsova describes a model of integrating language techniques with leading-edge technology to develop a web-based on-line tool for heritage language preservation and e-learning. Bulgarian language resources – parallel corpora and a bilingual dictionary – are presented in an interactive way using a common web-

interface, which is accessible for students, faculty, and affiliated Heritage language communities.

The paper by I Derzhanski and O. Siruk examines the occurrences and correspondences of terms for affinal kinship in a Bulgarian–Ukrainian parallel corpus of fiction by comparing the frequencies of their instances, matching and non-matching.

S. Kovacheva’s paper describes cultural heritage sites in Bulgaria under the protection of UNESCO as database elements that can be used for e-learning. The learning environment will motivate intellectual inquiry and, through organizing the methods of collecting and managing information, will create cultural knowledge for existing and new sites, which will be evaluated and promoted.

- *Short papers*

The paper by S. Kovacheva, L. Dimitrova and K. Pezhgorski describes an E-learning environment, currently under development, which will present UNESCO architectural heritage sites in Bulgaria. The environment is based on the State Educational Standards for learning content of the “Social Sciences and Civil Education” subject cycle. The project aims at applying this software environment in appropriate educational course forms related to the culture and history of Bulgaria.

G. Bogdanova, T. Todorov and N. Noev’s paper presents digital knowledge including context-based annotations of objects in the field of cultural heritage. Some major problems and solutions of digitalization of items, their processing, storing and organizing them in a repository are highlighted. The authors show how graph databases could be used as data management platform.

The paper by N. Noev, G. Bogdanova and T. Todorov explains an online platform with textual data, images, audio and video recordings related to knowledge on bells. It was designed to provide digital data for representation of acquired knowledge. The platform includes a data repository of bell knowledge objects and a new search engine.

The paper by E. Shatko, G. Bogdanova and T. Todorov is a summary of a multi-year research into certification of Belarus bells of 16th—early 20th centuries collected as a result of a liturgical instruments study of 287 bell towers, churches and museums. This is also the first attempt to discuss the establishment of digital Belarusian Historic Bells Archive and introduction of a campaign handling basic trainings into educational programmes of religious educational establishments.

The topic of P. Hristov and E Petkov’s paper is an important task within the development of a web-based information system for visualization of three-dimensional models of museum exhibits whose main goal is to create a 3D website showing user experience of a spatial three-dimensional real space.

V. Georgiev, L. Milkov, Y. Angelov and S. Dimitrov’s paper describes an online environment for showing the human body in an interactive 3D format. By using that platform, various groups of medical personnel, patients and students can fully manipulate models of digitized male, female and child bodies.

- *Project papers*

R. Stewart, M. Zheleva-Monova, Y. Zhelev and R. Pavlov's paper presents the digitalization of the proceedings of the Regional Historical Museum, Burgas. As the experience of this project showed, the semantic description of the digitalized content was one of the most important parts in succeeding to offer usable online data.

The paper by S. Slavova-Petkova, M. Dimova and D. Luchev examines how a little child's understanding of fairy tales could be improved with the help of two contemporary learning methods—role-playing and serious games. A scenario for non-formal and fascinated study of fairy tales was explained with some actual examples using the serious game environment ADAPTIVES.

M. Krasteva's paper discusses the entering of art into a new era of artistic mass production caused by two major developments. The first is the rise of digital technologies for production of images and objects, while the second is a change in the understanding of what is art, changing the rules by which something is recognized as art or not.

The report by V. Katzounov presents work on a research project of the Scientific archive of BAS for the conservation of cultural heritage at risk. Two collections, created by Colonel Petar Darvingov and Aleksandar Bozhinov and representing photo and graphic illustrations of the pre-industrial development era of Bulgaria, are offered for the project.

A. Hershung's paper introduces software tool PABLO, which processes websites and transforms them into a dramatically simplified form that is simple enough for digital archiving yet exhaustive enough to preserve the websites content and appearance and allows users to browse the entire site like the original.

The paper by T. Trifonova and K. Zdravkov explores the possibilities of open-source systems to create digital libraries for the purpose of applying them to build a digital library—repository of scientific forums, organized by the Faculty of Mathematics and Informatics of the University of Veliko Tarnovo.

The paper by K. Koleva, K. Sotirova and E. Naidenova is focused on the theory, standards and good practices in digitization of archival documents, as implemented in the Scientific Archive at the National Institute of Archeology with Museum.

- *Demos*

B. Bontchev, D. Paneva-Marinova and L. Draganov's paper presents an educational 3D maze video game generated by the ADAPTIVES software platform and integrated with other video game for assessment of the player's knowledge and for ordering context-dependent images. The maze game introduces Bulgarian Orthodox iconographic arts by following specific learning methods for this domain.

Mirko Robov's paper explains the studying of the monuments and complexes in V. Tarnovo for giving some strong points for determining of earthquakes and providing

data for developing a digital model for this natural phenomenon in the urban environment, in accordance with the specific natural characteristics.

The study by I. Valev is devoted to conscription during socialism in Bulgaria and presents the digitization of materials and the research on conscription and ideas for creating a digital archive of soldiers' legacy of the socialist period.

The paper by P. Mihaylov presents a development of Regional Historical Museum—Pernik for digital passporting of museum artifacts. The digitalization of the museum funds is an important process in the realization of the most important functions of museums in Bulgaria.

Veliko Tarnovo, 26 September 2016

Radoslav Pavlov Peter Stanchev
Editors



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- 9 MAY 2016

Dear Mr Stanchev,

I wish to thank you for your letter of 24 February, 2016, by which you request UNESCO's support for the sixth international conference on Digital Presentation and Preservation of Cultural and Scientific Heritage that is to take place in Veloko Tarnovo from 28 to 30 September 2016.

At the outset, UNESCO wishes to congratulate the organizers of this event, the aim of which is to promote the unrestricted dissemination of scientific knowledge. I am confident that the conference will stimulate discussion on a wide 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 look forward to receiving a report on its outcomes in due course.

Respectfully,

Yours sincerely,

Irina Bokova

Enc.: General Conditions