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Editors



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

Veliko Tarnovo, Bulgaria

September 18–21, 2014

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Proceedings of the Fourth International Conference *Digital Presentation and Preservation of Cultural and Scientific Heritage – DiPP2014*, Veliko Tarnovo, Bulgaria, September 18–21, 2014 (Volume IV)

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Fourth International Conference DiPP2014 Digital Presentation and Preservation of Cultural and Scientific Heritage

Veliko Tarnovo, Bulgaria
September 18–21, 2014

Conference Objective

The Fourth International Conference on *Digital Presentation and Preservation of Cultural and Scientific Heritage—DiPP2014* 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 prototypes 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)*. DiPP2014 is supported by the *Ministry of Education and Science* and is under the patronage of *UNESCO*.

Accompanying Events

- Autumn training school *Development and Promotion of Open Access to Scientific Information and Research*, organised by the Institute of Mathematics and Informatics, Bulgarian Academy of Sciences and supported by the EU project FOSTER.
- National information day *Open access to scientific information*, organised by the Institute of Mathematics and Informatics, Bulgarian Academy of Sciences.

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Preface

The main aim of the Fourth International Conference *Digital Presentation and Preservation of Cultural and Scientific Heritage (DiPP2014)* 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 St. Christodoulakis presents some recent trends in the field of digital cultural heritage management and applications including digital cultural data curation, interoperability, open linked data publishing, crowd sourcing, visualization, platforms for digital cultural heritage, and applications.

Kr. Stefanov's paper focuses on an innovative approach for enhancing digital libraries functionalities. An innovative distributed architecture involving digital libraries for effective and efficient knowledge sharing was developed.

M. Nisheva-Pavlova, N. Spyrtos and Peter Stanchev's paper discusses some current trends in the area of development and use of semantic portals for accessing heterogeneous museum collections on the Semantic Web. The presentation is focused on some issues concerning metadata standards for museums, museum collections ontologies and semantic search engines.

PRELIDA (PREserving LInked DAta) - an FP7 Coordination Action funded by the European Commission under the Digital Preservation Theme, is in the focus of presentation of C. Meghini.

D. Laurent overviews the French project on heritage called PATRIMA and focuses on two projects funded by PATRIMA named EDOP and Parcours and dealing with data integration.

G. Amato, F. Falchi, F. Rabitti and L. Vadicamo consider the task of recognizing epigraphs in images such as photos taken using mobile devices. They used a k-NearestNeighbor approach in order to perform the recognition. The contribution of this work is in evaluating state-of-the-art visual object recognition techniques in this specific context.

The paper by J. Rákosník, P. Stanchev, R. Pavlov presents recent developments in the domain of digital mathematics libraries towards the envisioned 21st Century

Global Library for Mathematics. The Bulgarian Digital Mathematical Library BulDML and the Czech Digital Mathematical Library DML-CZ are founding partners of the EuDML Initiative and through it contribute to the sustainable development of the European Digital Mathematics Library EuDML and to the global advancements in this area.

- *Full papers*

The paper by H. Kang, E. Stoykova, N. Berberova, J. Park, Y. Kim, J. S. Park, S. Hong, B. Ivanov, D. Nazarova and N Malinowski presents two holographic 3D printing techniques which combine digital 3D representation of an object with analog holographic recording. Generation of digital contents is considered for a holographic stereogram printer and a recently proposed wavefront printer.

Vi. Georgiev's paper describes a recently-developed web application for creating and presenting expositions of three-dimensional objects online.

The paper by T. Todorov and N. Noev describes essence and challenges in the process of three-dimensional scanning of objects. Special attention is paid to the methodology of 3D scanning of cultural artifacts.

O. Turcoane's paper discusses the importance of linked data for the semantics of cultural and scientific heritage and it provides some reasons on using JSON-LD as a standard.

St. Bozov and E. Zaharieva-Stoyanova's paper views the problems related to the development of knitting software for hand-made knitting. It introduces an XML approach for digital representation of knitting patterns.

The paper by I. Deák, Z. L. Márkus, T. Szkaliczki, G. Kaposi, György Szántó², M. Veres and Z. Weisz presents a mobile application introducing the heritage values in historical cemeteries. The application is developed for both the experts of the domain and people merely interested in the topic.

D. Paneva-Marinova, M. Goynov, D. Luchev's paper describes a service for automatic sharing of iconographical artefacts and full collections from the Bulgarian Iconographical Digital Library to selected Facebook communities.

The paper by K. Rangochev, M. Dimitrova and M. Goinov analyses statistical data concerning the use of the electronic Encyclopedia Slavica Sanctorum, an e-product with information about the texts about saints in medieval and early modern Slavonic manuscripts and printed books and in records of oral stories of the Bulgarian popular culture.

D. Paneva-Marinova, L. Pavlova, Vi. Sapundjiev and M. Bogdanova's paper focuses on the overall structure and the functional specification of an interactive environment for digital preservation and preservation of fashion objects, developed to serve the students' learning needs of the National Art Academy.

I. Burešová and J. Štruncová explain the principles the Open Access Policy of the Academy of Sciences of the Czech Republic adopted as a consequence of its accession to the Berlin Declaration on Open Access. They discuss a special feature of the DML-CZ represented by the highly heterogeneous collections devoted to eminent personalities of the Czech mathematics.

R. Dutsova describes in her paper a software system for preservation of Bulgarian language resources – parallel corpora and bilingual dictionaries. The system allows an open access to digital language resources via internet.

I. Derzhanski and O. Siruk examine the metaphoric mentions of three wild animals considered to be most important in the Slavic popular tradition, namely the wolf, the bear and the hare, in a Bulgarian–Ukrainian parallel corpus.

- *Short papers*

The problems of protection of semantic organized data and encryption of RDF graph are investigated in G. Bogdanova, T. Todorov and Nikolay Noev's paper. Technologies used in the construction of a semantic network are presented.

E Rusinova discusses in her paper existing approaches to digitize cultural heritage. Bulgarian practice and foreign experience are presented and possible priorities are listed.

T. Cholakov and D. Birov propose in their paper an approach relying on a combination of virtual hard disks and checksums for data preservation.

The paper by F. Hollaus, A. Camba, S. Fiel, S. Saleem and R. Sablatnig presents image acquisition and processing techniques devoted to the analysis of ancient manuscripts that have been developed in an interdisciplinary project named 'The Enigma of the Sinaitic Glagolitic Tradition'.

In the framework of the Belgian BELSPO AGORA 3D and DIGIT03 programs, A. Mathys, J. Brecko and P. Semal have evaluated 3D digitising technologies with regards to the quality of the acquisition, the capacities and limitations of each technique and also the direct cost of the different 3D digitisation processes.

P. Sharlandjiev, D. Nazarova and N. Berberova report in their paper numeric simulations of 2D image filtering and present digital image denoising by adaptive median filtering and wavelet transform.

The paper by K. Varbanova-Dencheva and R. Todorova stresses on the active role of university repositories in sustaining a long-term strategy to increase impact and visibility of Bulgarian research, and suggests continuing the development of good practices in establishing a national information infrastructure, based on an already functioning integrated platform.

St. Kovacheva's paper describes the database, developed by IMI-BAS to present the cultural heritage sites in Bulgaria under the protection of UNESCO and used in an e-learning project to integrate additional learning content to the "Man and Society" and "History and Civilization" courses.

- *Project papers*

J. Pancza's paper presents a project called ELDORADO that provides a new service model and infrastructure environment in digital library field and is a major upgrade of National library services in Hungary.

The paper by J. Espinosa reflects on the experience of PanamaTipico.com, an independent website specialized in the research and preservation of the cultural heritage of the Republic of Panama

R. Stewart, M. Monova-Zheleva, Y. Zhelev and L. Draganov's paper describes a project framework for building a virtual collection titled "Coins of the Burgas Bay" considered as a collection from digital objects presented in an interactive environment, rendered in a web browser.

The paper by M. Stoyanova, D. Paneva-Marinova, L. Pavlova and Radoslav Pavlov focuses on the IFIDA project: Intelligent Fast Interconnected Devices and Tools for Applications in Archaeometry and Conservation Practice.

K. Ivanova, G. Bogdanova, K. Zdravkov, R. Pavlov and D. Paneva-Marinova's paper presents the project „North +“ for documenting, preserving and providing public access to the cultural heritage in libraries, museums, archives and galleries in North and Central Bulgaria.

The paper by G. Bogdanova, D. Koleva and P. Hristov introduces an interactive map of cultural objects of Veliko Tarnovo, integrated into the eCity platform of the project for e-Municipality Veliko Tarnovo.

N. Vladimirova and R. Badichah's paper refers to the role of the Church as an institution which is important for the preserving the cultural heritage of the ethnic communities in the Diaspora and, in particular, how the Armenian Catholic Church in Rome is involved in the preservation of the tangible and intangible cultural heritage of the Armenians in the Italian capital city.

O. Slijkhuis describes in his paper a solution with an industrial approach consisting of a conveyor belt construction with a fully automated processing workflow for mass digitization of a scientific biodiversity collection.

The paper by A. Krandeva discusses issues connected with the audio archives digitization in the Bulgarian National Radio (BNR). It contains an overview of the audio archive digitization process, the current situation about the BNR archives, setting up a workplace for BNR digitizing of audio archives.

Detelin Luchev, Stanislava Slavova-Petkova and Maria Dimova's paper introduces a gaming platform and scenarios for games focused on children to get acquainted with the peculiarities of the Bulgarian traditional costume.

- *Demos*

S. Marlokov, V. Bozhilova and M. Karadecheva's demo presents a 3D virtual museum application, having in mind the Regional Museum of History – Plovdiv.

The demo of Pl. Sabev focuses on the development of the R. M. H. V. T computer game (Hidden objects) which is for using by the visitors of the Museum of Archeology of Veliko Tarnovo.

Veliko Tarnovo, 18 September 2014

Radoslav Pavlov Peter Stanchev
Editors



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06 MAY 2014

Dear Professor Stanchev,

Thank you for your letter of 15 December last, by which you request support for the Fourth International Conference on Digital Preservation and Preservation of Cultural and Scientific Heritage that will take place in Veliko Tarnovo from 18 to 21 September 2014.

UNESCO is pleased with the efforts made by the Bulgarian Academy of Sciences to facilitate a timely dialogue on best practices and research with respect to preservation and heritage. The Organization believes that the storage and transfer of knowledge is key to building knowledge societies, facilitating the generation of knowledge and promoting a culture of peace across generations, all of which are thematic areas covered by UNESCO's mandate.

I am pleased, therefore, to have supported the event in 2013 and gladly grant the Organization's patronage to the 2014 Conference. Furthermore, I authorize the use of UNESCO's logo in accordance with the attached General Conditions.

With regard to your request for financial support, I invite you kindly to contact Bhanu Neupane, Programme Specialist in the Knowledge Societies Division (tel.: +33.1.45.68.43.65; e-mail: b.neupane@unesco.org), to explore funding possibilities and other modalities of participation.

I have every confidence that this year's event will build on the success of last year's, and I look forward to receiving a report on the outcome of the Conference in due course.

Yours sincerely,

Irina Bokova

Enc.

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