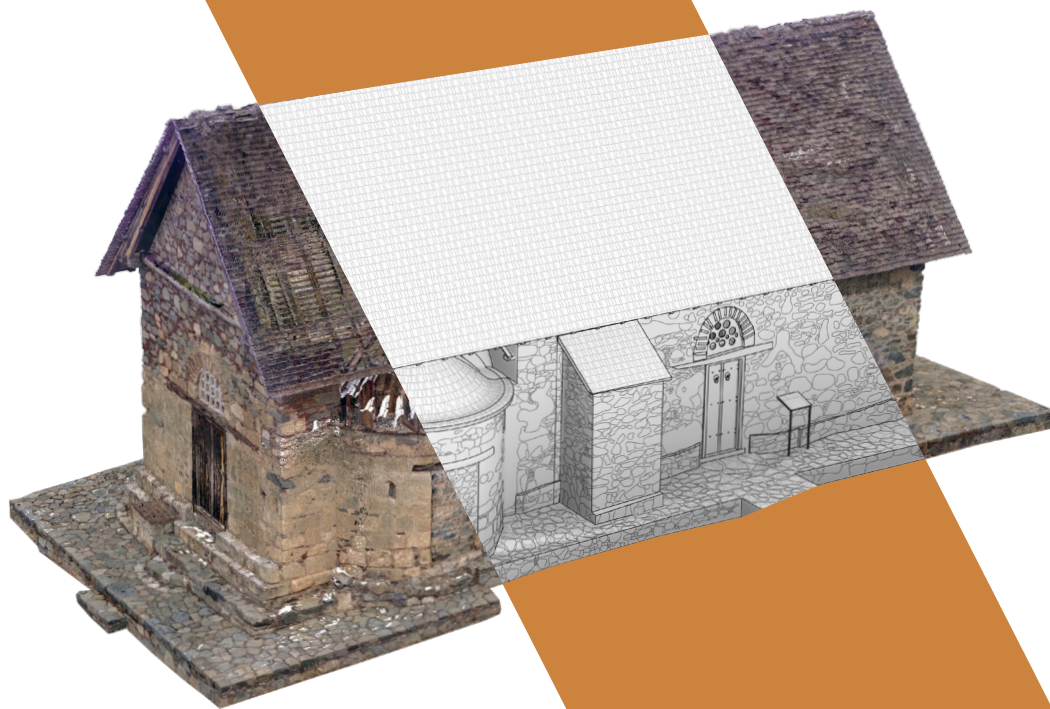


EURO MED 2020

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EUROPEAN-MEDITERRANEAN CONFERENCE 2020
CONFERENCE PROGRAMME



TABLE OF CONTENTS

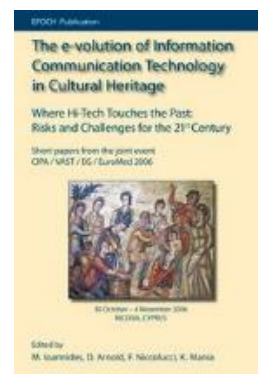
TABLE OF CONTENTS	1
PUBLICATIONS.....	2
COMMITTEE	7
KEYNOTE SPEAKERS	9
EU PROJECTS & CHAIRS.....	28
RESEARCH INFRASTRUCTURES	33
INTERNATIONAL ORGANISATIONS	34
WORKSHOPS.....	36
Workshop1 - The 2nd EU Workshop on how digital technologies can contribute to the preservation and restoration of Europe's most important and endangered Cultural Heritage sites.	36
Workshop2 - The 5th International Workshop on 3D Research Challenges in Cultural Heritage to be organized by the EU H2020 ERA Chair Mnemosyne project.	39
Workshop3 - Digital Transformation for User Engagement in Cultural Heritage.	54
Workshop4 - 1st International Workshop on Cultural Tourism: Discovery Europe.	57
Workshop5 - Digital Heritage Crowdsourcing: Present and Future.	72
PAPER SESSIONS	74
SPONSORS & SUPPORTERS	112
IN COOPERATION WITH	112

PUBLICATIONS

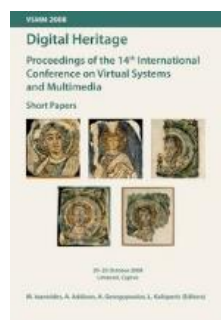
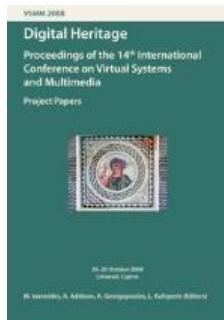
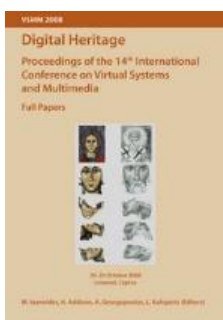
**Proceedings of
CIPA/VAST/EG/EuroMed 2006:
37th CIPA international
workshop dedicated on e-
documentation and
standardisation in cultural heritage.**



*Editors: Ioannides, M., Arnold, David, Niccolucci,
F. and Mania, K.*



We present here 32 full papers, selected from 66 submissions which focus on interdisciplinary and multi-disciplinary research concerning both cutting edge Cultural Heritage Informatics and the use of technology for the representation, documentation, archiving and communication of CH knowledge.



Digital Heritage

**Proceeding of the 14th International
Conference on Virtual Systems and
Multimedia**

*Editors: M. Ioannides, A. Addison, A. Georgopoulos,
L. Kalisperis (Eds)*



This volume contains the Project Papers presented at VSMM 2008, the 14th International Conference on Virtual Systems and Multimedia which took place on the 20 to 25 October 2008 in Limassol, Cyprus. The conference title was "Digital Heritage: Our Hi-tech-STORY for the Future, Technologies to Document, Preserve, Communicate and Prevent the Destruction of our Fragile Cultural Heritage".

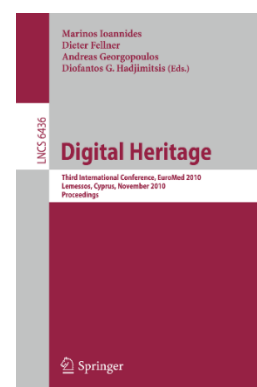
Digital Heritage

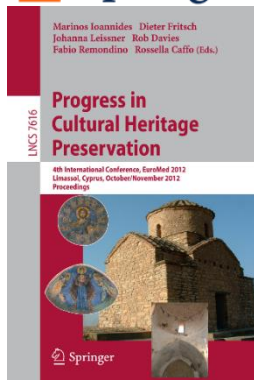
**Third International Euro-
Mediterranean Conference, EuroMed
2010, Lemessos, Cyprus, November
8-13, 2010. Proceedings**



*Editors: Ioannides, M., Fellner, D., Georgopoulos, A.,
Hadjimitsis, D. (Eds.)*

This volume comprises the proceedings of the Third International Euro-Mediterranean Conference (EuroMed 2010) on the historical island of Cyprus. The focal point of this conference was digital heritage, which all of us involved in the documentation of cultural heritage continually strive to implement.





Progress in Cultural Heritage Preservation

4th International Conference, EuroMed
2012, Lemesos, Cyprus, October 29 --
November 3, 2012, Proceedings

Editors: *Ioannides, M., Fritsch, D., Leissner,*

J., Davies, R., Remondino, F., Caffo, R. (Eds.)

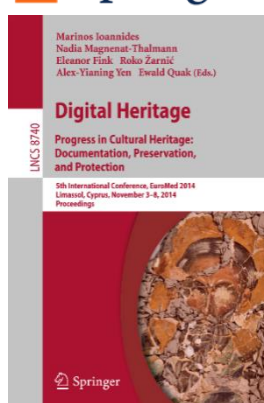
This book constitutes the refereed proceedings of the 4th International Conference on Progress in Cultural Heritage Preservation, EuroMed 2012, held in Lemesos, Cyprus, in

October/November 2012. The 95 revised full papers were carefully reviewed and selected from 392 submissions.

3D Research Challenges in Cultural Heritage A Roadmap in Digital Heritage Preservation

Editors: *Ioannides, Marinos, Quak, Ewald (Eds.)*

This book contains selected contributions from some of the most renowned researchers in the field of Digital Heritage and 3D representation of the Past, based in large part on invited presentations from the workshop "Computational Geometry and Ontologies for Cultural Heritage 3D Digital Libraries.



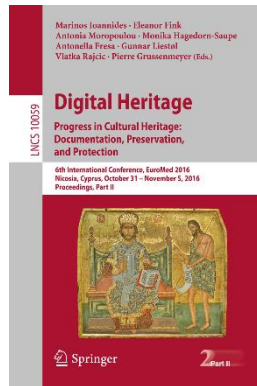
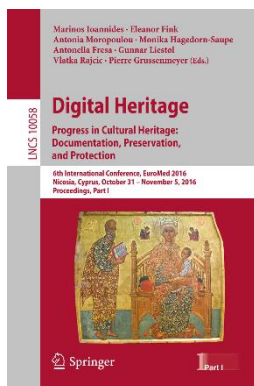
Digital Heritage

Progress in Cultural Heritage. Documentation, Preservation,
and Protection 5th International Conference, EuroMed 2014,
Limassol, Cyprus, November 3-8, 2014, Proceedings

Editors: *Ioannides, M., Magnenat Thalmann, N., Fink, E., Zarnic,*

R., Yen, A.-Y., Quak, E. (Eds.)

This book constitutes the refereed proceedings of the 5th International Conference on Digital Heritage, EuroMed 2014, held in Limassol, Cyprus, in November 2014. The 84 full and 51 short papers presented were carefully reviewed and selected from 438 submissions.



**Digital Heritage
Progress in
Documentation,
Preservation,
and Protection**

**Cultural Heritage:
Preservation, and**

6th International Conference, EuroMed 2016,
Nicosia, Cyprus, October 31 – November 5, 2016, Proceedings, Part
I & II

Ioannides, M., Fink, E., Moropoulou, A., Hagedorn-Saupe, M., Fresca, A., Liestøl, G., Rajcic, V., Grussenmeyer, P. (Eds.)

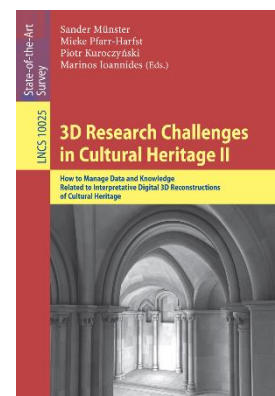
This two-volume set constitutes the refereed proceedings of the 6th International Conference on Digital Heritage, EuroMed 2016, held in Nicosia, Cyprus, in October/November 2016. The 29 full papers, 44 project papers, and 32 short papers presented were carefully reviewed and selected from 502 submissions.



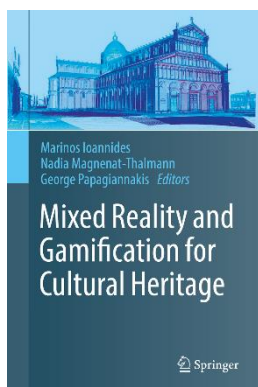
3D Research Challenges in Cultural Heritage II

**How to Manage Data and Knowledge Related to Interpretative
Digital 3D Reconstructions of Cultural Heritage**

Münster, S., Pfarr-Harfst, M., Kuroczyński, P., Ioannides, M. (Eds.)



This book reflects a current state of the art and future perspectives of Digital Heritage focusing on interpretative reconstruction and including as well as bridging practical and theoretical perspectives, strategies and approaches. Comprehensive key challenges are related to knowledge transfer and management as well as data handling within an interpretative digital reconstruction of Cultural Heritage including aspects of digital object creation, sustainability, accessibility, documentation, presentation, preservation and more general scientific compatibility.



Mixed Reality and Gamification for Cultural Heritage

Ioannides, M., Magnenat-Thalmann, N., Papagiannakis, G. (Eds.)

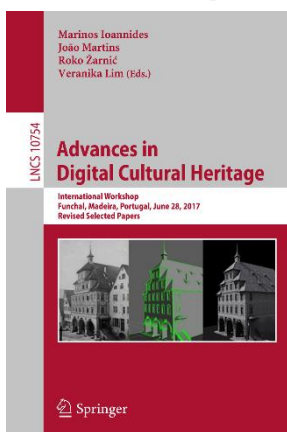
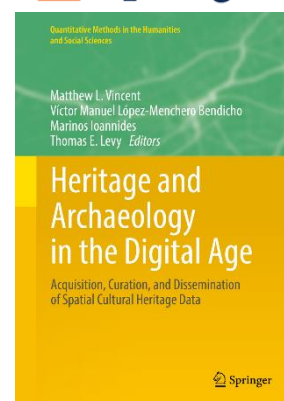
This book offers an essential introduction to the theories, development and applications of enabling technologies for mixed reality and gamified interaction in the context of cultural heritage and creative industries. Following a pedagogical model developed by the focus group of the first EU Marie S. Curie Fellowship Initial Training Network on Digital Cultural Heritage, it presents both enabling technologies and their applications to tangible and intangible cultural heritage.

Heritage and Archaeology in the Digital Age

Acquisition, Curation, and Dissemination of Spatial Cultural Heritage Data

Editors: Vincent, M.L., López-Menchero Bendicho, V.M., Ioannides, M., Levy, Th.E. (Eds.)

Examines and outlines best practices in computational research's applications in cultural heritage, demonstrating where the field is and where it is going. Guides readers through three fundamental stages of interaction with heritage data, demonstrating best practices for acquisition, curation and dissemination chapters bring together experts from North America and Europe, as they present both transdisciplinary and transnational perspectives on heritage and technology



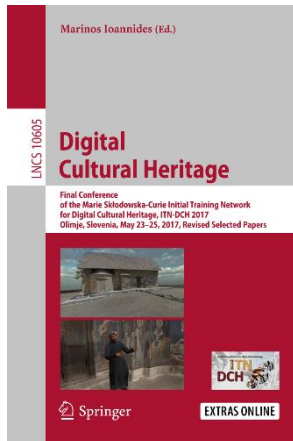
Advances in Digital Cultural Heritage

International Workshop, Funchal, Madeira, Portugal, June 28, 2017, Revised Selected Papers

Editors: Ioannides, M., Martins, J., Žarnić, R., Lim, V. (Eds.)

This book constitutes the papers of the International Workshop on Analysis in Digital Cultural Heritage 2017, held in Funchal, Madeira, Portugal, in June 2017.

The 16 full and 19 poster papers were carefully reviewed and selected from 93 submissions.



Digital Cultural Heritage

Final Conference of the Marie Skłodowska-Curie Initial Training Network for Digital Cultural Heritage, ITN-DCH 2017, Olimje, Slovenia, May 23–25, 2017, Revised Selected Papers

Editors: Ioannides, Marinos (Ed.)

Features the state of the art in digital cultural heritage research presents interdisciplinary and multi-disciplinary research. Focuses on e-documentation and e-preservation of cultural heritage.



Digital Heritage. Progress in Cultural Heritage: Documentation, Preservation, and Protection



7th International Conference, EuroMed 2018,
Nicosia, Cyprus, October 29–November 3, 2018,
Proceedings, Part I & Part II

Editors: Ioannides, M., Fink, E., Brumana, R., Patias, P., Doulamis, A., Martins, J., Wallace, M. (Eds.)



This two-volume set LNC5 11196 and LNC5 11197 constitutes the refereed proceedings of the 7th International Conference on Digital Heritage, EuroMed 2018, held in Nicosia, Cyprus, in October/November 2018.

The 21 full papers, 47 project papers, and 29 short papers presented were carefully reviewed and selected from 537 submissions.

COMMITTEE

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GR
GR
TW
LT
GR
CZ
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GR
IT
CY
ES
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IT
GR
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PT
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GR Zuppiroli, Marco

GR
DE
GR
TW
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KEYNOTE SPEAKERS



Harry Verwayen - Executive Director Europeana Foundation, Netherlands

Europeana Harry Verwayen- Executive Director Europeana Foundation, the operator of the Europeana platform. Across Europe, museums, galleries and archives digitize their collections. Europeana supports these organisations in their digital transformation by making these collections available as widely as possible so that people can find and use them. For work, for learning or just for fun. Our work is guided by creative collaboration, supportive teamwork and the idea that sharing and reusing cultural content can positively transform the world. Prior to this Harry worked at the Amsterdam based think tank [Knowledgeland](#) where he was responsible for business model innovation in the cultural heritage sector. Harry holds a MA in History from Leiden University and has worked over ten years in the Academic Publishing Industry. Mediocre tennis player, reasonable cook, aspiring photographer.

PRESENTATION TITLE: *Culture Shock! Covid-19 & digital transformation of cultural heritage*

ABSTRACT:

In recent months, culture has shown to be a compelling force: people turned to digital technology and communication to share culture and come together as families, in friendship groups and as communities. Now is the time to look critically at the role of cultural heritage and reimagine it.



**Dr. Christoph Fröhlich - Christoph Held,
Zoller & Fröhlich GmbH**

Dr. Christoph Fröhlich is the CEO of Zoller+Fröhlich, one of today's leading laser scanner manufacturers. In 1988, after finishing his studies in electrical engineering, he was appointed scientific assistant at the chair for automatic control engineering at the Technical University of Munich. In 1996 he obtained a PhD with the topic "Active generation of corresponding depth and reflectivity images and their use to capture the environment."

In 1994, while still completing his doctorate, Christoph Fröhlich joined his parents' company and in 1996 was appointed another managing director of Zoller + Fröhlich GmbH and bfz Steinmeier GmbH with joint representation rights. Today the siblings Cathrin Fröhlich and Christoph Fröhlich are running the family business successfully in the second generation.

As the first company in the world, a 3D laser scanner for measuring surroundings was successfully launched on the market in 1996. In the following years, this technology was continuously improved, so that it could be used in many areas, including the measurement and documentation of cultural heritage. Since then, many international research

projects and international papers have been carried out and the company received numerous international awards, showing the usability of the technology worldwide.

PRESENTATION TITLE: TLS Documentation of Tangible Cultural Heritage - Challenges and Solutions

ABSTRACT:

Today, terrestrial laser scanners are widely used for the documentation of cultural heritage throughout the world. Over the past decades, scanning has become a lot easier and faster and provides more detail than ever. However, the process of digitization still provides many challenges. This presentation will focus on the different levels of complexities that need to be understood to guarantee successful projects and the best data quality. This includes the complexities of the objects, as well as the technical aspects of laserscanners that are being used for the digitization.

The presentation is held from the perspective of the laserscanner manufacturer Zoller+Fröhlich, who will provide technical insights, show the current state-of-the art technology, and provide an outlook into the future.



ArcTron^{3D}
Expertise in Three Dimensions

**Martin Schaich - Chief Executive Officer,
ArcTron 3D GmbH, Germany**

Martin Schaich is the Chief Executive Officer, of ArcTron 3D- Vermessungstechnik & Softwareentwicklung GmbH and Head Archaeologist at ArcTron – Ausgrabungen & Computerdokumentationen. He is an expert in 3D surveying for archaeological and cultural heritage management, scanning (aerial, terrestrial, mobile and high resolution) with experience in 3D laser scanning, documentation through photogrammetry, videogrammetry, 3D GIS and 3D modelling. Through his work with ArcTron, he has a vast amount of experience and knowledge of working with multimedia services for the 3D virtual reproduction and reconstruction of objects, sites and monuments, through VR, AR, animation and film. Schaich has been recognised through his various National and International books and papers, including 'Geoinformatics. Magazine for Surveying, Mapping & GIS Professionals', and J. Thurston's book, 'Preserving History with Geospatial Technology' with his paper, '3D Scanning for Archaeology and Cultural Heritage'. He is also an active member of four German archaeological associations, including the German Association for Pre and Early History and the West and South German Archaeological Association.

PRESENTATION TITLE: Object Complexity vs. Model Complexity

ABSTRACT:

The "hen-egg" metaphor, known since antiquity, refers to the question of a causal chain whose events represent cause and effect. A problem - comparable in a broader sense - occurs in numerous publicly announced "Cultural Heritage" 3D documentation and 3D visualization projects. For professional service providers, the question always arises: is price or quality decisive? Or in other words: why is price alone often the award criterion in many CH projects today?

Rarely is the project-specific task defined so comprehensively in terms of quality, complexity and quantity or definable for the tendering bodies that there would not be massive leeway in the price calculation. Correspondingly, the fluctuation range in the bids is enormous in many competitions!

The question arises as to how and whether a competition with possible budget frameworks or budget ceilings could be designed in which basic quality criteria are defined, but in which the competitor is given the opportunity to show what he is able to achieve specifically for the available budget. In the current VIGIE2020/654 study of the European Union exactly such connections are under discussion, which we try to approach as external partner of this study. In order to further circumscribe the problem in an exemplary way, the talk will present three different projects of our engineering office specialized in CH in more detail and will analyze them regarding their value chains.

The first project is the comprehensive and, in many areas, sub-millimeter accurate surveying and modeling of the interior and inventory of the former monastery church St. Michael in Bamberg, which is part of the cultural world heritage and currently Germany's largest church restoration project. The budget available here in the small 6-figure Euro range enabled us to propose and realize a comprehensive, high-quality 3D documentation concept, which also includes the sustainable later use of the data. In the second project a well-known archaeological site, the famous Mycenaean palace castle of Tiryns (Greece) was 3D surveyed for an exhibition project and reconstructed and visualized in two Mycenaean phases (1250/1200 AD). The example shows how a flexible surveying approach was used to respond to challenges encountered on site and which contents could be implemented within a medium 5-digit Euro budget.

As a third project, we present a company-internal trainee project that was created with a minimal 4-digit budget within the current Corona Shutdown 2020. It is a small but interesting Romanesque church near our headquarter, which was documented in a short time but with comprehensive combined technologies and presented during the virtual "Open Monument Day" 2020. Finally, the projects are summarized with regard to their possible character for the exemplary definition of budget-dependent, qualitative and quantitative standards.



UPPSALA
UNIVERSITET

Prof. Isto Huvila,

Information Studies at Uppsala University, Sweden

Professor Isto Huvila holds the chair in Information Studies at the Department of ALM (Archival Studies, Library and Information Studies and Museums and Cultural Heritage Studies) at Uppsala University in Sweden and is adjunct professor in information management at Åbo Akademi University in Turku, Finland. During the academic year 2019/20 Huvila was working as a visiting professor at the School of Information (iSchool, Library, Archival and Information Studies) at The University of British Columbia in Vancouver, Canada. Huvila is currently directing ERC Consolidator Grant funded research project CAPTURE that investigates what information about the creation and use of research data that is paradata) is needed and how to capture enough of that information to make the data reusable in the future. He is also the chair of the COST Action Archaeological Practices and Knowledge Work in the Digital Environment (ARKWORK). His primary areas of research include information and knowledge management, information work, knowledge organisation, documentation, research data, and social and participatory information practices. He received a MA degree in cultural history at the University of Turku in 2002 and a PhD degree in information studies at Åbo Akademi University (Turku, Finland) in 2006.

PRESENTATION TITLE: What all is (not) paradata? Documenting the making and provenance of archaeological and heritage information

ABSTRACT:

We might have enough data about archaeological data and collections but not a good enough understanding of how the data and collections came about. Current digital documentation and collection management systems provide increasingly comprehensive and easy-to-use functions to keep track of what happens when data and objects are managed and manipulated within the systems. The digital lifecycle within dedicated systems is still only a part of everything that has an influence on how data and collections come into being and what their current and future users might need to know about it to make them usable and useful.

The on-going CAPTURE research project investigates what information about the creation and use of research data (i.e. paradata) is needed and how to capture enough of that information to make the data reusable in the future. The wickedness of the problem lies in the practical impossibility to document and keep everything and the difficulty to determine how to capture just enough to complement information that is already available in the collection data itself and that can be deduced by combining available direct and indirect evidence.

This presentation explores the question of what all things might count as 'paradata' i.e. data that can inform future users of the processes relating to how data and collections have come into being. It stresses the importance of thinking about paradata and the processes of making, broader than as a linear list of events.



Prof. Petros Patias,
Aristotle University of Thessaloniki, Greece

Petros Patias is a Professor, Director of Laboratory of Photogrammetry & Remote Sensing and ex-chairman at the School of Rural and Surveying Engineering (2003-2007), The Aristotle University of Thessaloniki (AUTH), board member of the Department of Urban Planning, AUTH (2004-2012) and Vice Rector at the University of Western Macedonia (2010-2015), Greece.

Eng. (1981) The Aristotle University, MSc (1985) and PhD (1987) both from the Dept. of Geodetic Science and Surveying, The Ohio State University, USA.

Chairman of various ISPRS (International Society of Photogrammetry and Remote Sensing) WGs from 1992 onwards, ISPRS Commission V President (2000-2004), CIPA (international Committee for Architectural Photogrammetry) President (2003-2007) and Honorary President (2013-for life), ISPRS Fellow (2016-for life), President of the Hellenic Society of Photogrammetry and Remote Sensing (1992-1996). Visiting Professor at various European universities (TU Delft, ETH Zurich, Universidad del País Vasco).

Editor-in-chief of the "South-Eastern European Journal of Earth Observation and Geomatics" e-Journal (<http://ejournals.lib.auth.gr/seejeog>), Scientific reviewer to 51 Journals.

Reviewer/evaluation to numerous promotions/elections to all Greek universities. In addition, internationally, he served as evaluator to promotions at National Research Council, Canada (2004), State University of New York, USA (2011), University of Haifa, Israel (2012), Politecnico di Torino, Italy (2015, 2016).

Evaluator to research proposals (besides Greece) to NSERC Discovery Grant Applications, Canada (2013), Research Promotion Foundation Grants, Cyprus (2013), External Evaluation of Higher Education Institutions, Cyprus (2013), Israeli Ministry of Science, Technology and Space Grants, Israel (2014, 2016), Italian Research and University Evaluation Agency (ANVUR) Grants, Italy (2004-2016), Italian Ministry of Education, University and Research (MIUR) Grants, Italy (2015-2016), Ministry of Education, science and Technological Development Grants, Serbia (2016).

Supervised 101 undergraduate Diploma Theses, 73 MSc Theses and 38 PhD Dissertations.

Published work includes 6 books, 11 chapters in international books and 259 papers in journals and proceedings.

Scientific Responsible, Principal Researcher or member of Research Group to a total of 91 Research Projects funded by European or National Organizations.

PRESENTATION TITLE: Object Complexity vs. Model Complexity

ABSTRACT:

Object Complexity is of course very important since it has a high impact on various aspects of 3D digitization: it suggests different technologies to be used, it reflects on the required or achievable quality, it may put limits on the intended purpose of use and impacts on the time and budget of survey. Therefore, it is not surprising that the term “Complexity” is quite often used in CH documentation literature and practice.

What is not expected though, is the fact that it remains a vague term with no clear definition, no subjective methodology of calculating, and no clear connection to Quality, Purpose-of-use, or other imposed restrictions. In other words, the tooling of “Object Complexity” as a decision-support tool is still a gap.

The major function and usefulness of a definition is to clear up concepts and to lead to a fruitful decision-making workflow. However, currently, we discuss the object complexity as a value of its own, which cannot be estimated subjectively, it can be defined only AFTER we make all the measurements on the object (making it useless for 3D digitization planning and decision-making) and it is neutral to intended use (making it useless for choosing the best technology, or setting up the technical specifications for the 3D digitization).

We propose to shift our attention from the “Object complexity” to “Model complexity”. This means that our focus is not the complexity of the real object per se (which is connected to the data capture phase), but the complexity of the produced model (which is connected to the data processing phase). This may look like a conceptual compromise, but the alternatives are worse. Either we ignore this fact, or we make subjective guesses.



Roko Žarnić - Vlatka Rajcic,

Bene Construere, Croatia

Roko Žarnić is Professor of building materials at University of Ljubljana, Faculty for Civil and Geodetic Engineering (UL FGG), since 1993. His research background is in earthquake engineering with a particular interest for built heritage preservation, development of structural elements made of advanced materials (laminated glass and FRP) and inelastic computational models for assessment of structures. He joined the University from the position of director general of Slovenian National Institute for Research in Materials and Structures (ZRMK) where he started his career in 1974. In 1995 he established a Chair for Testing of Materials and Structures at UL FGG and lead it until his retirement from teaching in 2015. After retirement he continues his work as research advisor at University of Ljubljana and in Croatian research SME Bene Construere Ltd. In 1999 he was for six months a Fulbright visiting scholar at University of Colorado at Boulder, CO and in 2006 for six-month national detached expert to EU JRC Laboratory at Ispra, Italy. From 2010 to 2012 he was on duty of Minister of Environment and Spatial Planning of Republic Slovenia.

In European Construction Technology Platform (ECTP) he co-coordinated Focus Area Cultural Heritage (2006-10) and was individual expert appointed in his personal capacity to Horizon 2020 AG for Societal Challenge 5 (2013-2015). He

took part in one INTERREG IVc project, seven EUREKA projects, nine COST Actions and 20 FP projects since FP4 till H2020. He coordinated one FP7 project (EU-CHIC).

The last decade he was a partner of several FP7 and H2020 EU funder projects in domain of digital cultural heritage. In April 9 2019 he was chairing the session named "Cultural Heritage in Digital World" within the World Construction Forum 2019 that took place in Ljubljana, Slovenia. (<https://www.wcf2019.org>).

Vlatka Rajčić is Professor of structural engineering at University of Zagreb, Faculty for Civil Engineering (GFUNIZG), since 1992. Her research background is in structural engineering with a particular interest for built heritage preservation, lightweight structures, innovative hybrid structural elements, various computational models for design of structures and use of AI techniques in structural design. She is a licensed structural designer, licensed auditor of structural projects as well as scientific advisor and director of company Bene Construere Ltd., Zagreb, Croatia. She has done numerous designs of retrofitting and sanation projects for immovable tangible heritage. She has done also numerous auditing of the sanation projects in last 20 years. She participated in the development of semantic platforms as a background of the 3D digitization of immovable and movable, tangible cultural heritage; digital data based assessment and Heritage BIM development taking part as beneficiary in projects dealing with digital cultural heritage: H2020 INCEPTION, FP 7 Marie Curie ITN-DCH; as well as in FP7 project Climate for Culture and Smart Monitoring of Historic Structures contributing the projects in the topics of assessment of the structural elements using Non-destructive techniques, drones and by numerical modelling of heritage structures on the influence of climatic loads. She participates in development of the next generation of Eurocode 5 - related to strengthening and retrofitting, of immovable timber cultural heritage; organizes scientific and professional events (e.g. Days of licensed engineers from 2012 till now every year in Croatia). Currently she is a Head of Structural department at the University of Zagreb. She is a Professor, teaching at undergraduate, graduate and postgraduate level courses in Constructive Aspects of Cultural Monuments Protection and Special Chapters in Assessment of Cultural Heritage objects at the postgraduate study, courses in Timber Structures I and II at the university undergraduate study and Structural glass, Aluminum and Membrane, structures as well as the courses Artificial Intelligence in Structural Design and Wood Composites at the postgraduate scientific study. She is the leader of a domestic scientific project, VETROLIGNUM, - a multipurpose CLT-glass hybrid panel, participant and responsible person for the implementation of the 4 FP7 project, 2 Horizont2020 project, 1 FP7 Marie-Curie project and many ERASMUS project. In European Construction Technology Platform (ECTP) she coordinated group Education and Ethics in Focus Area Cultural Heritage (2006-2010) and was individual expert working as evaluator for many FP7 and Horizon 2020 calls (2010-2020). She took part in twelve COST Actions and 6 FP projects since FP6 till H2020. She also coordinated bilateral projects.

PRESENTATION TITLE: Identification of complexity and quality in 3D documentation by through the significance of cultural heritage assets.

ABSTRACT:

Cultural heritage assets comprise a wide range of tangible and intangible aspects that as a whole determine and enable evaluation of the asset. The inclusive assessment of assets leads to a holistic understanding of the variety of its significances. It enables correct preventive conservation, efficient site management and sustainable use of asset to enable extension of its life supported by self-acquiring of needed funds. However, the need for the holistic but yet in-depth understanding and data exploitation principles is commonly understood by professionals engaged in cultural heritage preservation. The current development of ICT tools and introducing of 3D documentation of heritage assets brings a new momentum to the discipline. In this contribution the importance of identification of significances that defines a particular heritage asset and study of their interaction is presented. It is illustrated by application to the study of heritage assets resilience to natural and man-made hazards, application to analysis of economic potential in heritage

assets located in cultural environment and post disaster evaluation of heritage asset that was 3D documented before the occurrence of an earthquake. The illustration is based on the nine groups of significances pertaining to heritage assets that are divided in three subgroups each. It will be put in the context of data collection organized in two major groups: the group of general characteristics of heritage asset and group of characteristics presented in detail. The detailed analysis of complex 3D documentation enables a proper decision making regarding to preventive and post-disaster interventions in heritage assets as well as planning and execution of heritage asset management.



Alastair Rawlinson,

Historic Environment Scotland

Alastair Rawlinson is Head of Digital Innovation and Learning at Historic Environment Scotland, based at The Engine Shed, Scotland's Building Conservation Centre. He joined HES in 2017 and is responsible for the strategic development and implementation of innovative digital technologies to directly support conservation of the historic environment, training and education initiatives, and to advance digital accessibility. He has extensive experience in heritage digital documentation and visualisation and specialises in the management and delivery of large scale, complex digital documentation projects. Alastair is a product designer, with a B.Sc. (Hons) from Glasgow Caledonian University. He has almost 20 years' experience working in the 3D visualisation sector, including 11 years at The Glasgow School of Art, where he undertook digital documentation of an entire city to create the 'Urban Model of Glasgow', before leading on the Scottish Ten Project for GSA and co- managing the Visualisation team. He is passionate about 3D technologies and the practical applications of 3D data for the benefit of historic and industrial sites.

PRESENTATION TITLE: Addressing Complexity and Quality in the Digital Documentation of Immovable Cultural Heritage: The Forth Bridge UNESCO World Heritage Site Case Study

ABSTRACT:

Historic Environment Scotland (HES) is the lead public body established to investigate, care for and promote Scotland's historic environment. Within HES, we have long advocated the use of innovative digital technologies and increasingly apply these for conservation, asset management, engagement, accessibility and disaster response. We are currently undertaking a large multi-year project to digitally document the 336 properties and thousands of collections objects in the care of HES on behalf of the Scottish Government. The immovable and movable assets we digitally document vary considerably in complexity and we strive for the highest quality possible. This presentation will detail our approach to 3D digital documentation of a large-scale historic engineering structure and live railway bridge – the Forth Bridge UNESCO World Heritage Site.



Prof. Andreas Georgopoulos

Prof. Charalabos Ioannidis

National Technical University of Athens, Greece

Dr. Andreas Georgopoulos is full Professor of Photogrammetry and Director of the Lab of Photogrammetry of the School of Rural & Surveying Engineering of NTUA. He holds a Diploma of Surveying (NTUA 1976) and an MSc (1977) and a PhD (1981) in Photogrammetry from University College London. He has been

teaching Photogrammetry and Documentation of Monuments since 1980 in UCL, NTUA and as visiting professor in KULeuven (RLICC - ArchDOC), CUT (Dept. of Civil & Geomatics Eng.) and the University of the Aegean. He has been Vice-Head (1998-2002) and Head (2002-2006) of the School of Rural & Surveying Eng. and member of the Research Committee of NTUA since 1999. Since 2006 he is a member of the Executive Board of the ISC of ICOMOS CIPA-Heritage Documentation and has served as Secretary General (2010-2014), President (2015-2019) while currently he is Vice-President. Since 1985, he has participated in numerous research projects of the Lab of Photogrammetry concerning Digital Photogrammetry and Monument documentation. He has published approx. 250 scientific papers in international journals and conference proceedings. His research interests focus on 3D modeling of cultural heritage, photogrammetric automation, and digital contemporary techniques.

Charalabos Ioannidis is a Professor at the Lab of Photogrammetry, School of Rural & Surveying Engineering, NTUA. He is the Dean of the School and the Deputy Director of the Interdisciplinary Programme for Postgraduate Studies in 'Geoinformatics'. He is the Chair of the Working Group 3.2 'Geospatial Big Data: collection, processing, and presentation', Commission 3 of FIG.

He teaches the courses of Photogrammetry and Documentation of Historical Monuments since 1995. He has published more than 160 papers and another 45 presentations in Conferences. He serves as a reviewer in several peer reviewed journals, books and international conferences. His main research fields include: Cultural Heritage geometric documentation, multi-dimensional modelling, city modelling, automatic change detection, data fusion, satellite photogrammetry, land management, etc.

He has been the scientific supervisor of 12 research projects in the last 15 years, 3 of them are bilateral cooperation with France, Cyprus and Israel; also, he has participated as principal investigator in another 23 research projects, national or international (funded by EU, etc).

PRESENTATION TITLE: The impact of monument complexity and data quality on the documentation of tangible cultural heritage

ABSTRACT:

The holistic digital documentation of a cultural monuments is widely accepted to be a prerequisite for the preservation of the cultural heritage worldwide. The documentation implies several actions for acquiring the most suitable digital geometric and semantic data for this purpose. This task cannot be independent of the nature and the characteristics of the object, provided that there are detailed specifications for all stages of the documentation, from data collection (data type, techniques), processing (methods, techniques) to products extraction (accuracy, reliability, product type, level of detail). The data acquired include accurate quantitative and detailed qualitative measurements. The more complex the object the more difficult this task is, as it is imperative that care should be taken to acquire all details necessary for the documentation. It is necessary to develop and apply metrics for defining object complexity and the factors affecting it. On the other hand, data and products' quality should comply with the standards set for each task.

In this presentation the terms of monument complexity and data quality will be defined and analysed and an attempt will be made as to how these characteristics affect holistic digital documentation. A variety of case studies are presented as examples of good practice for different types of monuments, in terms of size, features and products required.



POLITECNICO
MILANO 1863

Prof. Raffaella Brumana, University of Polimi, Italy

Dr. Raffaella Brumana, Full Professor of Geomatics at the Politecnico di Milano, Head of dABCLab Gicarur

Classic High School. Master Degree in Architecture at the Politecnico di Milano with honours (1989). Ph.D. in Geodetic and Topographic Sciences. Since 07/01/2016 Full Professor (Geomatics), Politecnico di Milano, Dept. of Architecture, Built Environment and Construction Engineering (dABC). Head of DABCLab Gicarur (4D BIM-GIS-SDI), Geospatial Information@Content modeling: Architectural heritage & Built environment & EUrbAtl@s Surveying. She teaches Innovative Advanced Surveying techniques, Surveying&Modelling Techniques within the Preservation Studio Lab at the M.Sc.Arch (AUIC School, 7th position in the Int. QS University Ranking 2020).

Research activities: Digitization, Surveying, modelling and monitoring of Architectural Heritage and Built Environment, Archaeological site. Lidar, TLS, MMS and Photogrammetry, multi-spectral RGB, IRT/NIR images, UAV and satellite data. Geospatial information: informative models, SCANToBIM, 4D HBIM (Historical Building Information Model & management), VR/AR/MR, Architectural Object Library (vaults, masonry, ceilings) within Common Data Environment. WEB GIS, BIM-GIS, OpenData, Virtual Hub APP, Climate change landscape pressures and mitigation using EO (Copernicus programme).

EU 7FP and H2020 funded research projects (EASEE, GE20, ENERGIC-OD, ALDREN), EU FESR (HOMEBIM liveAPP).

Consulence contracts (Royal Villa of Monza, Milan, Basilica di San Marco, Venice, Basilica di S.Ambrogio, Milan, Milan Cathedral, Arquata del Tronto Earth-quaked hamlet). Basilica di Collemaggio L'Aquila (awarded by Europa Nostra 2020). 2009-2020 Member of the Scientific Board of the POLIMI School of DABC Doctoral Studies and 2001-2009 Department DIIAR.

Arqueológica 2.0 and GEORES GEOmatics and pREServation', 2021 Valencia, Spain (Co-chair); GEORES2019 (CIPA-ICOMOS, ISPRS event), Chair; EUROMED2018 (Co-chair), 2017 CIPA Ottawa (ICOMOS and ISPRS). Editor /Associate Editor/ Guest Editor Activities and Special issues. More than 200 peer review scientific publications.

PB ECTP EEB PPP Private Public Partnership; E2BA (Energy Efficient Building Association) Steering Committee; SB of UNESCO-OPEN FORUM Mesopotam (Albania). AB ERACHAIR, CUT Cyprus. ICOMOS, CIPA, Copernicus Academy Member.

Internship programmes. 2016-2020 Executive Committee of Partnered Research Training Initiative 'New Paradigm / New Tools', Canada SSHRC (Social Sciences and Humanities Research Council, Canadian Government). 2011-2020 ARCHDOC Architectural Heritage Documentation for Conservation, RLICC (Unesco Chair on Preventive conservation and monitoring of monuments and Sites, KUL, Be). FORMAT-EO ERASMUS IP, UK. Traineeship Supervisor, Thesis Supervisor, PhD supervisor and co-supervisor: NTUA (Athens, GR), Kul Leuven, CUT (CY) and others.

PRESENTATION TITLE: Building and sharing knowledge from quality driven content models

ABSTRACT:

3D models - from passive subjects often reduced to images related to written documents and drawing – have the opportunity to become core digital gears leveraging knowledge, tools through which to decode the complexity of cultural heritage, extract contents, integrate them with multidisciplinary data : a gear of a circular knowledge building process where to connect the reality with its digitization, historical reports and sources, monitoring sensors, conveying information to a differentiated user, scholars, operators and citizen of mankind. In one word 'live' digital twins continuously growing within a complex built environment, under the hazards, natural anthropic pressures as climate change, earthquakes.

Still in the limbo of the society of image, between media and big technological potential offered by digitisation, and a substantial under-use in the daily long life cycle maintenance and communication.

To become an active subject of knowledge, they need a qualitative leap towards content creation, content use and content transferring.

Several ingredients can contribute to achieve this result: on one hand the wealth of detail ensured by equipment conjugating massive acquisition with high accuracy, on the other hand advanced processing methodologies supporting representation of the complex geometries capable of capturing the uniqueness of the architectural complex and its components. But precision is not enough. Complex geometries become communicative of complex subjects only if they are reflected in the knowledge of materials, construction techniques, techniques of workmanship and craftsmen handing down such techniques from generation to generation over the centuries.

3D quality models must conjugate geometry with the surface texturing, to let deriving how the geometry is influenced by the construction techniques. A wealth of knowledge that passes through the uniqueness of the subject with its materials and techniques, its 'habeas corpus', its identity card crossing the centuries.

3D content models means 3dmodels capable to decode the complexity of behaviour that comes from the stratified results of centuries, the transformation phases impacted by hazards in a fragile context: it means that the out plumbs after an earthquake must relate the anomalies, irregularities and specificities, correlating the reading of the different stratigraphic units with the aim to better understand the disconnections occurred and the differentiated damages in order to drive the preservation role and prevent disjoining with proper connections.

Informative quality models progressively enriched by all the information coming from the BIM uses (materials, decay analysis, construction techniques, decorations, surfaces finishing, structural behaviour, energy performances) can support the preservation design project and decision making process till to the life cycle management. At the same time each piece of research, the single informative model gained – considered as a node - can contribute to the generation of libraries of object across space and centuries, highlighting permanencies and mutations of the construction techniques highlighting the unsuspected richness of components like vault systems through which high quality models digitization is returning to us the history of constructive wisdom and domination of cutting stones in the space (stereotomy) of more complex forms than those that fall within the typological classifications cited in the historical manuals, driving the masonry techniques with a multiplicity of results. It is the case of 'trompe' shaping capacity building (Guarino Guarini) or framed vaults across Europe with the art to build in the space complex models saving centrings and fasting the process with uniqueness of variety.

Quality driven model allows building knowledge and building capacities opening the doors of informed communication using co-working spaces, common data environment and geospatial hubs with linked informative model objects (as HBIM), in the form of Linked Open Data (LOD), enriching and augmenting reality also by using VR/AR/MR. This requiring common language exchange and vocabularies taking in account the richness of the subject and technical words within multi-disciplinary languages.

Standardization and ad hoc guidelines addressing the complexity of cultural heritage as in the case of LOD-LOG-LOA-GOA definition in the HBIM can contributes to avoid misunderstanding and misuses in the re-use and circulation of the 3D models, libraries and sites, building capacities and growing DG content skills.



Herbert Maschner – Global Digital Heritage, USA

Positions Held: Currently President and Chief Scientist, Global Digital Heritage Inc, a 501c3 non-profit. Formally, Executive Director, Center for Virtualization and Applied Spatial Technologies (CVAST), University of South Florida. Professor, Department of Anthropology and Professor, School of Geosciences, University of South Florida. Visiting Professor, al dipartimento di Scienze Storiche e Beni Culturali, University of Siena; Director and Professor, Idaho Museum of Natural History; Associate and Assistant Professor, Department of Anthropology, Idaho State University.

Research: Virtualization, visualization, informatics, 3D scanning, and public science. Creation of digital research infrastructures that transcend humanities, physical, natural, and social sciences. Digital heritage, digital humanities, museum and research informatics, and digital natural history at regional and global scales. Active projects in France, Spain, Italy, Portugal, Bosnia, Sharjah UAE, Turkey, Uzbekistan, Morocco, Alaska. Methodological interests in 3d imaging, digital heritage, and database construction, elemental and isotopic analyses, geographic information systems, social networks, and complex systems analysis.

Other current specialties in human biocomplexity and the environment, resource and community sustainability, complex systems and modeling, long-term human impacts and interactions with marine ecosystems, fisheries, ocean modeling, and human ecosystem engineering. Theoretical specialties in evolutionary psychology, warfare and inequality, global historical ecologies, public education and the democratization of science, and virtual museums and repositories.

Grants and Publications: Principal Investigator on ≈\$17.6 million in grants, including PI on ≈\$5.9 million from the National Science Foundation (22 awards as PI). Published 3 monographs, 9 edited volumes, 1 edited journal section, 118 articles, chapters, reviews (91 peer-reviewed). Also, 30 conferences and symposia organized, 250+ conference presentations with abstracts, 100+ invited lectures, and 50+ professional reports.

PRESENTATION TITLE: 3D Documentation of Tangible Cultural Heritage: From Scarab Seals to Ancient Cities with the NGO Global Digital Heritage

ABSTRACT:

Global Digital Heritage (GDH) is an international non-profit entity that has scanned more heritage artifacts, sites, and landscapes than any other organization in the world. We do this for free. Specializing in lesser known heritage sites and collections, GDH has projects in ten countries and has over 3000 models on Sketchfab and other platforms. With a fundamental goal of the Democratization of Heritage by making models and collections free to the world, GDH has developed rapid and detailed techniques for the documentation, dissemination, and storage of 3D assets. In the context of these projects, GDH has indirectly addressed and managed the problems identified in the first four Tasks of the European Study on quality in 3D digitisation of tangible cultural heritage.

To solve Task 1 (complexity), we have employed both handheld engineering grade laser scanners and photogrammetry for small items, ground-based photogrammetry and terrestrial laser scanners for larger items and monuments, and aerial photogrammetry and LiDAR for larger sites and landscapes. We have also developed workflows that integrate these data in order to place small artifacts and sites in a broader context.

What makes a quality digital documentation as posed by Task 2? Our simple answer is that if it is of such detail and precision that it can be used for analysis: measurements, color, features, design, manufacture, construction, motifs, and other factors, without having to refer to the original artifact or place, then it is good enough.

When it comes to standards, benchmarks and methodologies to be discussed in TASK 3, GDH has taken a simple approach. Collect as much data as possible with the highest quality possible, and make sure everything is scaled or georeferenced. Everything else can be solved in the computer. But metadata is a larger problem. Not a problem for how the photos or scans were done, but rather, the data on the artifact or site itself – these are the most critical details required for making digital heritage useful.

TASK 4 wants us to “identify and analyse past or ongoing 3D digitisation projects or 3D objects that could serve as benchmarks for 3D digitization.” There are a few interesting and very important projects and groups. A simple perusal of Sketchfab museums and organizations, and some individuals, show that there are projects producing many hundreds of 3D models, most in obscurity, but of very high quality. But the problem is fundamental, we spend too many conferences and workshops talking about 3D data acquisition, and not enough time in the field actually do digital acquisition.

This presentation will present a visual overview of GDH in the context of these four tasks. It will highlight some of our successes, identify our less successful projects, and discuss how these projects have transformed museums, small communities, and regional archaeological administrations.



Prof. Sander Münster, Time Machine Organisation

Sander Münster is J. Professor for Digital Humanities (Object / Images) at the Friedrich-Schiller Universität Jena. He got elected as Secretary of the Time Machine Organisation in 2019 and is responsible for outreach and innovation/business development/partnerships with third parties. Previously, he headed the Department for Media Design at the Media Center at the Technische Universität Dresden and the junior research group UrbanHistory4D. He received his PhD in educational technology from the TU Dresden, where he studied history, education and business. Since 2016 he has been a Young Investigator at the Faculty of Education at the TU Dresden and from 2018 to 2019 visiting professor in computing science. His main research topics are in the visual digital humanities about interdisciplinary teamwork, 4D information systems, 3D reconstruction technologies, bibliometric analysis and investigations on the community as well as business development, funding consultancy and policies.

PRESENTATION TITLE: Big Data of the Past - Building Blocks towards a virtual Time Machine

ABSTRACT:

What would the world look like if we could access documents from the past as easily as we can access data from the present? Could we use it to make better forecasts for the future? Can historical 4D simulations improve our knowledge of history? Which innovative business models will promote tourism, transport and planning? The Time Machine Organisation (<https://timemachine.eu>) consists of more than 650 research facilities, GLAM institutions and private companies and currently aims at nothing less than building a time machine as a spatio-temporal scaled digital twin. During a one-year preparatory phase financed by the EU, a 10-year research program for a large-scale research initiative with contributions from more than 1000 scientists was put together. In this presentation the Time Machine Initiative and its planned research program will be presented. Special emphasis is placed on the challenges of capturing and enriching 3D and 4D data from various fields as well as current examples and reference projects of the Time Machine members.



Ronald Haynes,
Cambridge University, UK



Edward Silverton, Mnemoscene

Ronald Haynes is a University Computer Officer who has been part of academic ICT in the US and UK, including previously as University of Bristol's Computing Service Information Officer, course developer and provider, Arts Faculty Graduate Centre Committee member and postgraduate researcher in Philosophical Theology, and first Webmaster, with the University site short-listed for a national award. Moving to Cambridge first as Computer Manager for Selwyn College, then becoming Deputy IT Manager for the Cavendish Laboratory, he later joined the University Computing Services' Institution Strategy team - involving liaison, consultancy, course development and provision, professional and community development. Following the IT Review and with the formation of University Information Services, he and the team transitioned to a deeper strategic focus on the needs of selected institutions, as a Relationship Manager for Colleges, as well as a wider responsibility for the needs of the University Information Technology community, as an IT Community Development Manager. Having helped found Cambridge's College IT Management Group (CITMG) and Departmental IT Group (DITG), he remains active in supporting both groups' goals of mutual support and shared solutions. Active technical research interests include collaborative technologies for unifying communications and sustaining distributed and learning communities, cultural and investigative potentials for Augmented Reality, and other complementary physical and virtual 3D technologies. More recently, he has presented and published in the area of the use of Augmented Reality in museums. Formerly he was a consultant, technical writer and editor in Pittsburgh (USA) and London, developing on and publishing about the interworkings of the main micro systems. He is a Governor of St. Mary's School (Cambridge), a Trustee of the Eckhart Society, and holds BCS, ACM, Computer Society, and IEEE membership.

Edward Silverton is a Co-founder of Mnemoscene, with a BSc in Computer Science from Napier University, Edward has 20+ years of experience in web development, 8 of which in the Galleries, Libraries, Archives, and Museums (GLAM) sector. As co-chair of the IIF 3D Community Group, Edward is a sought-after conference speaker, and is a regular fixture of the international IIF community conferences, having presented at the Europeana Conference in Lisbon, The Vatican, MoMA New York, The US National Gallery of Art, The Library of Congress, and many other institutions. He is lead developer of the Universal Viewer, a popular open source viewer for cultural heritage content which is the chosen solution for the British Library, National Library of Wales, National Library of Scotland, V&A, and BFI. The Universal Viewer is the primary interface for the British Library's Save Our Sounds project, and has recently been adopted by Duke University as part of their Morphosource

PRESENTATION TITLE: IIF 3D: Complementing IIF 2D & AV standards with 3D interoperability and sustainability

ABSTRACT:

The IIIF 3D community group <https://iiif.io/community/groups/3d/> enables institutions interested in interoperability to coordinate strategies and facilitate conversations about open standards that support 3D use cases. Many of the desired operations and interactions with 3D data are similar to the 2D and A/V use cases of IIIF for sharing images and annotation, and organizations are increasingly looking to integrate exhibits, displays, and comparisons of 3D data with other file types. Two of the IIIF 3D Co-Chairs will share highlights of related projects, experiments and discussions which are helping to evolve possibilities for 3D interoperability and sustainability. Included will be collected user stories and samplings of 3D Workflows For Cultural Heritage, and an introduction to a 3D viewer comparison project - looking at animation, transparency, rendering, view sharing, annotations. In addition some work concerning related model variations, metadata, and persistent identifiers for objects will be shared. There will be an invitation to share additional user needs and stories, to expand a shared understanding of the wider community's requirements, to consider while developing 3D to better fit within existing IIIF standards for 2D, AV, etc.



**Dr. Rebecca Dikow – Research Data Scientist,
Smithsonian Institution Data Science Lab, USA**

Rebecca Dikow is a Research Data Scientist and leads the Smithsonian Institution Data Science Lab, part of the Office of the Chief Information Officer. She has a B.Sc. in Biology from Cornell University and a Ph.D. in Evolutionary Biology from the University of Chicago. Her dissertation research focused on using whole-genome data to build evolutionary trees. After the completion of her Ph.D., she was a Biodiversity Genomics postdoctoral fellow at the Smithsonian. Since starting the Data Science Lab in 2016, she has been conducting biodiversity research using genomics, informatics, and machine learning tools. More recently, the Data Science Lab has begun working with researchers studying digitized collections and archives data outside the biodiversity sphere and strives to collaborate with scholars all across the Smithsonian. The Data Science Lab also provides support for researchers using the High-Performance Computing Cluster and training in data science and bioinformatics tools. She is also an affiliated faculty member in the George Mason University School of Systems Biology and the Smithsonian-Mason School of Conservation.

PRESENTATION TITLE: Data-intensive approaches to digitized museum collections

ABSTRACT:

With digitized museum collections objects and associated metadata accumulating rapidly in open access repositories, we are now able to exploit data-hungry machine learning techniques in order to evaluate fundamental research questions as well as to improve accessibility and discoverability of digitized collections and archives for multiple audiences. In this talk, I will detail two initiatives across the Smithsonian Institution that are laying the groundwork to allow us to scale-up in these areas. First, a project that seeks to build deep-learning computer vision models to identify thousands of species of ferns. These models are now being used to ask questions about biogeographic patterns of diversity. Second, work in support of the American Women's History Initiative to surface stories of women's contributions to science at the Smithsonian using data from multiple collections databases and archives. Each of these projects serves as an exemplar for how we might implement these techniques at scale across the 19 museums, 9 research centers of the Smithsonian and other collections-based and cultural heritage institutions around the world.



Prof. Doug Boyer,
Duke University/Morphosource,
USA



Carla Schroer, Director of Cultural Heritage Imaging,
USA

Doug Boyer is an associate professor in the department of evolutionary anthropology at Duke University in Durham, North Carolina. He has a long history working for museums and with museum collections. In 2013 he launched MorphoSource.org as an archive for 3D data on museum objects. The site now has 12,000 users and hosts data from 1,400 contributors and 500 museum collections. There are 140,000 3D datasets representing 40,000 specimens and 14,000 species of plants and animals. In 2020, MorphoSource 2.0 will be launching having been refactored as a preservation stack committed to open source software used and supported by library and digital humanity communities.

Carla Schroer is co-founder and director of Cultural Heritage Imaging (CHI) a non-profit corporation that develops and implements imaging technologies for cultural, historic and artistic heritage and scientific research. Carla leads the training programs at CHI along with working on field capture projects with Reflectance Transformation Imaging and photogrammetry. She also leads CHI's software development activities. She spent 20 years in the commercial software industry, managing and directing a wide range of software development projects.

PRESENTATION TITLE: Documenting and displaying workflows for 3D digital preservation: MorphoSource and CHI's Digital Lab Notebook

ABSTRACT:

To maximize and robustly maintain the knowledge conveyed by digital representations of natural and cultural heritage materials, standardized, yet flexible systems for documenting workflows of the digitization process are needed. These systems must allow easy updating of records and produce interoperable metadata describing openly understandable and community-supported file formats and structures. To incentivize adoption of this framework, strong attention must be paid to mechanisms that allow a diverse group of stakeholders to derive value from it. We present two different resources aimed at facilitating these goals: The Digital Lab Notebook (DLN) is a software pipeline made up of open source software tools and associated good practices. The DLN provides a greatly simplified, ordinary language-based, nearly automatic method to build the digital equivalent of a scientist's lab notebook, expressed as CIDOC Conceptual Reference Model (CRM) mapped Linked Data. It is designed for use with computational photography imaging technologies including Reflectance Transformation Imaging (RTI), photogrammetry, and Multi-spectral imaging. Morphosource.org is an openly accessible data repository intended to provide strong support for 3D data representing

natural and cultural heritage objects. It is a customized Hyrax instance using a Fedora digital asset management layer and Solr for efficient querying. It uses an entity-event data model for rich and flexible preservation of digitization workflows. For visual discovery and engagement, a variety of kinds of 3D resources can be interactively examined in MorphoSource with VR-ready, open source extensions of the Universal Viewer, a popular open source browser viewer. With data cited in almost 800 scholarly works, the most common users of MorphoSource so far are biologists and museum biodiversity collections.



Patricia Harpring - Managing Editor,

Getty Vocabulary Program, Getty Research Institute, USA

Patricia Harpring is the Managing Editor of the Getty Vocabulary Program, Getty Research Institute, in Los Angeles, which produces the Art & Architecture Thesaurus® (AAT), the Getty Thesaurus of Geographic Names® (TGN), the Union List of Artist Names® (ULAN), the Getty Iconography Authority (IA), and the Cultural Objects Name Authority® (CONA). Ongoing activities include large scale translations of the vocabularies in several languages, and otherwise expanding the multilingual, multicultural, and inclusive scope of the Getty Vocabularies. Patricia has been teaching seminars, conducting workshops, and writing about data standards and controlled vocabularies for art, architecture, and material culture for over two decades. She holds a PhD in art history. Among her publications are Introduction to Controlled Vocabularies, Guidelines for Multilingual Equivalency Work, editor Categories for the Description of Works of Art (CDWA), and co-editor Cataloging Cultural Objects.

PRESENTATION TITLE: Vocabularies for Access to History and New Knowledge: Focus on the Getty Vocabularies

ABSTRACT:

This paper discusses the roles of standards generally, and Getty Vocabularies in particular, for enabling good documentation within an institution, for sharing data across institutions, and for allowing access and discovery in the evolving field of digital art history. The Getty Vocabularies comprise the following resources: Art & Architecture Thesaurus (AAT)®, Getty Thesaurus of Geographic Names (TGN)®, Union List of Artist Names (ULAN)®, Getty Iconography Authority (IA)™, and Cultural Objects Name Authority (CONA)®. The Vocabularies contain structured terminology for art, architecture, decorative arts, archival materials, visual surrogates, conservation, and bibliographic materials. Compliant with international standards, they provide authoritative information for catalogers, researchers, and data providers. The Getty Vocabularies strive to be ever more multilingual, multicultural, and inclusive. In this paper, we will explore the features of the Vocabularies, elements of content and linking, international cooperation in their creation, and the methods of release and implementation of the Getty Vocabularies.



supper & supper

Maximilian Nowottnick, Data Scientist at Supper & Supper GmbH, GERMANY

Maximilian Nowottnick is a Data Scientist at the full-service data science provider Supper & Supper GmbH from Germany. He has a B.Sc. and a M.Sc. in Physics and extensive knowledge in developing AI solutions in the areas of GeoAI and Mechanical Engineering. He was one of the driving engineers to develop the first SaaS solution of Supper & Supper, called Pointly. Here he is mainly responsible for supervised and unsupervised segmentation of 3D data, model tuning and training as well as instance segmentation of classified point clouds. **Company description:** Supper & Supper develops customized AI solutions based on the latest developments in neural networks and machine learning and thus unlocks new geodata potential for you. But the data science provider also offers Pointly - an intelligent, cloud-based SaaS to manage and classify big data in 3D point clouds easier and faster than ever before. You can also take advantage of the expertise of Supper & Supper through Pointly Services, where innovative 3D deep learning solutions are offered to you.

PRESENTATION TITLE: How 3D Deep Learning solutions can improve the inventory of Cultural Heritage

ABSTRACT:

It is nothing new that 3D point clouds have a big potential to transform the way we used to capture the real world and extract valuable information out of it. The question is how to leverage this potential. Recent advances in 3D Deep Learning research show that the time is here to not only have digital twins but to apply AI solutions on 3D data. However, there is still a lack of end-to-end solutions, where you can manage, classify and analyze your point clouds. This is where Pointly and Pointly Services steps in. With Pointly, as an accelerated manual annotation tool, you can label your point clouds in a customized and easy way and generate training data faster than ever before for your AI case. Moreover, you can manage and store your data cloud-based, where data can be organized by feature classes, categorizations, lists and tags to make it valuable for further processing. However, Pointly Services offer the possibility to utilize the training data to train a Deep Learning algorithm to detect whatever matters to you. But simple automated detection is not the end of the line – there are many more AI solutions realizable like comparison between conditions of artifacts, height, or volumes of objects or to convert annotations into shape layers or other data formats. In this talk we will present Pointly and showcase how we applied Deep Learning on 3D point clouds to tap the full potential of this data.



Diofantos Hadjimitsis,

Prof. Cyprus University of Technology - EXCELSIOR H2020

Teaming Project & Eratosthenes Centre of Excellence, CYPRUS

He is a Full Professor at the Department of Civil Engineering and Geomatics of the Cyprus University of Technology. He is the Managing Director of the ERATOSTHENES CENTRE OF EXCELLENCE/ERATOSTHENES CoE <https://www.eratosthenes.org.cy> and coordinator of the EXCELSIOR Teaming H2020 Project (www.excelsior2020.eu). He is the member of the Board of 'The Cyprus Agency of Quality Assurance and Accreditation in Higher Education (CYQAA)' (<https://www.dipae.ac.cy/>). Diofantos G. Hadjimitsis was the Vice-Rector of Academic Affairs of the Cyprus University of Technology (2016-2019). He was the Chair of the Department of Civil Eng. and Geomatics from 2011 to 2015. He was the member of the National Experts appointed by the Cyprus Government for investigating the potential of Cyprus to join the European Space Agency (ESA) on 2009. He appointed from the Cyprus Research Promotion Foundation as a national delegate/contact point for the FP7 framework in the 'SPACE' on 2011. He has been nominated and elected as SPIE Senior member 2014 for his achievements in remote sensing. He worked in the past at the University of Southampton (UK), University of Surrey (UK) and Frederick Institute of Technology (CY). He worked also in the construction industry (roadworks, highway engineering, project management) as well in the remote sensing industry. He is a member of the Technical Chamber of Cyprus (ETEK), EARSeL (national representative), ISPRS, NEREUS. He is the leader of the Mediterranean Regional Information Network (MedRIN) GOF/GOLD/ NASA.

Diofantos holds the following educational qualifications: PhD in Remote Sensing: University of Surrey, Department of Civil Engineering, UK. (1996-1999), MPhil in Remote Sensing: University of Surrey, Department of Civil Engineering, UK. (1996-1997), BEng (Honours) in Civil Engineering (First Class Award): University of Surrey, Department of Civil Engineering, UK. (1994-1996), Higher National Diploma in Civil Engineering (Distinction): Higher Technical Institute, Cyprus (1989-1992) and MSc in Real Estate & Property Management (Distinction): University of Salford, UK (2005-2007).

He has significant experience in research projects that include earth observation, remote sensing, GIS, field spectroscopy, geomatics and civil engineering. He has more than 450 publications in journals, conference proceedings, and chapters in books and monographs in the field of remote sensing and GIS. He has supervised 13 PhD researchers and 150 bachelor and master final year projects and dissertations in the fields of remote sensing, GIS, civil engineering, surveying engineering and geomatics. He is the co-coordinator of MSc in Geo-informatics and Geospatial Technologies at CUT. He has participated in more than 70 funded projects and since his appointment at the CUT (2007) (> 30 research projects as a coordinator) with funding sources from FP6, FP7, Horizon 2020, Interreg, ECHO, Eureka, Life +, MED, Marie Curie, ERASMUS+, COST, ESA, EC regional funds, national funds such as the Cyprus Research Promotion Foundation (CRPF) and industry. He is the member of the editorial team of the 'Open Geosciences' and MDPI Remote Sensing, MDPI Heritage, MDPI Sensors etc. He is the coordinator of the 'EXCELSIOR' H2020 Teaming Project (<https://www.excelsior2020.eu>). The EXCELSIOR (ERATOSTHENES: EXcellence Research Centre for Earth Surveillance and Space-Based Monitoring of the Environment) is a newly granted project from the Horizon 2020 Framework for

Research and Innovation of the European Union (Grant Agreement number: 857510). Through the EXCELSIOR Horizon 2020 Widespread Teaming Phase 2 project, a new, autonomous and self-sustained Centre of Excellence, the ERATOSTHENES Centre of Excellence (ECoE) has been established based on the existing 12 years of the research capacity of the Remote Sensing and Geo-Environment Lab of the Department of Civil Engineering and Geomatics of the Cyprus University of Technology. The total funding of the EXCELSIOR H2020 Teaming project is: 15 million Euros from EC, 15 million Euros from the Republic of Cyprus and 8 million Euros from the Cyprus University of Technology.

PRESENTATION TITLE: The EXCELSIOR H2020 Teaming Project: Earth Observation & Geoinformatics Research and Innovation agenda for Cultural Heritage

EU PROJECTS & CHAIRS

UNESCO Chair on Digital Cultural Heritage

<https://digitalheritagelab.eu/>



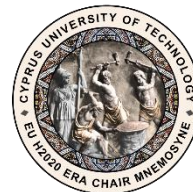
UNESCO Chair on
Digital Cultural Heritage at
the Cyprus University of Technology

The main objectives of the newly established UNESCO Chair on Digital Cultural Heritage at the Department of Electrical Engineering, Computer Engineering and Informatics at the Cyprus University of Technology over the next years are to:

- Carry out a wide-reaching program of awareness raising and knowledge-sharing programs on the role of Digital Cultural Heritage (DCH) in the Eastern Mediterranean region and beyond, utilizing conferences and events, web and social media channels, academic exchanges and all possible media publicity vehicles.
- Introduce model DCH curricula ('Cultural Informatics') at vocational, undergraduate and postgraduate levels and extend course availability, teaching and study facilities to students internationally through state-of-the-art e-Learning.
- Define, extend and carry out a program of research in digital heritage which will further UNESCO's cultural heritage agenda in the region and to impact its key objectives.
- Extend to communities across the region usable and affordable systems for telling the stories of their own heritage and expressing their identity online, in a context of inter-communal cooperation.

EU ERA CHAIR on Digital Cultural Heritage – MNEMOSYNE

<http://erachair-dch.eu>



Mnemosyne is a project for a single-stage Coordination and Support Action submitted under WIDESPREAD-03-2017 – ERA Chairs.

Cultural Heritage is a strategic resource for Europe with high cultural, social, environmental and economic value. The era of Digital Cultural Heritage (DCH) is now well underway and the European research resource for DCH has grown significantly in recent years. But the visible contribution of the Widening countries to this effort remains relatively weak. The Digital Heritage Research Laboratory (DHRLab) at Cyprus University of Technology (CUT) has been an exception in this respect, becoming a beacon in the Eastern Mediterranean and for Europe in general, in particular through its leadership of key initiatives in DCH research training and in policy co-ordination and support. While the Cypriot economy gradually recovers, in order to maintain and expand its leading role in DCH research, the DHRLab needs further investment. This project is an ideal

opportunity to ensure this by means of a well-designed and iterative process of strengthening its research capacity and restructuring of its role. Mnemosyne will proceed from the appointment of an outstanding researcher and research manager as the ERA Chair holder in 2018 who will attract, direct and maintain high quality human resources and negotiate and implement the necessary structural changes to achieve excellence on a sustainable basis. The project will be carried out over a period of 5 years. Following recruitment of the ERA Chair Research Team, a three-phase research programme centred on the holistic documentation of the DCH lifecycle in support of existing and potential user needs will be carried out and extensively evaluated, with strong attention paid to exploitation. Communication activities, will be strategically planned and refined from the outset of the work and will last throughout the project duration.

**European Study on quality in
3D digitization of tangible
Cultural Heritage – VIGIE
2020/654**



<https://digitalheritagelab.eu/>

The overall aim of this study is to improve the quality of 3D digitisation projects for tangible cultural heritage, in support of European Union cultural heritage strategies. This study will enable cultural heritage professionals, institutions, content-developers, and academics to define and produce high-quality digitisation standards for tangible heritage.

**ViRTUAL MULTIMODAL
MUSEUM PLUS**



<https://www.vi-mm.eu/>

The **ViMMPlus** initiative is the successor to the ViMM Coordination and Support Action, funded under the European Union (EU) Horizon2020 programme, October 2016 - March 2019, in order to define and support high quality policies, strategic decision-making, the utilisation of breakthrough technological developments and to nurture an evidence-based view of growth and development impacted by Digital Cultural Heritage (DCH). ViMM was selected as a success story and its Manifesto, Action Plan and Roadmap were influential in the Member States Declaration Cooperation on Advancing Digitisation of Cultural Heritage in connection with EU digital day 2019. All the results of ViMM are visible on its platform <https://www.vi-mm.eu>. ViMMPlus continues to be coordinated by the Digital Heritage Research Laboratory at Cyprus University of Technology, holder of the UNESCO Chair in Digital Technology and the Horizon 2020 European Research Area Chair in Digital Technology, through its emphases on promoting international cooperation between digital heritage agencies and its work on standardisation for the holistic documentation of advanced 3D digitisation.

Interreg V-A (Greece – Cyprus)
DigiArc: Preservation and promotion
of medieval cultural heritage of
Aegean and Cyprus area.



<http://digiarc.eu/>

The challenge that the partnership needs to encounter recommends an implementation of a colossal project for the preservation and promotion medieval age monuments, which their significant value determines the cultural and generally the natural environment of the area. The implementation will happen using cutting-edge technology (terrestrial and aerial digital capture) that will document the monument and their natural environment with excellent precision. A significant challenge is the possibility of digital reconstitution, in part with digital rehabilitation techniques and according to bibliographic documentation, where it's needed. The project focuses on medieval fortification works and castles on the islands of Rhodes and Cyprus.

MARIE SKŁODOWSKA-CURIE ACTIONS
(ITN) – CHANGE: Cultural Heritage
Analysis for New Generations.



<https://change-itn.eu/>

The CHANGE project will train a new generation of early stage researchers towards a common goal, namely the assessment of changes of tangible cultural heritage (CH) objects and their monitoring in the atmosphere and/or during their conservation treatment using multimodal imaging techniques in complement to more traditional analytical techniques. Their research will consist of optimised data capture and their analysis, visualisation and management to ensure a better documentation and long-term preservation of our common EU CH. This work will be carried out within an interdisciplinary environment involving 5 CH and 4 Information & Communication Technologies (ICT) beneficiary institutions as well as 9 CH, ICT and industrial partners from 8 EU countries.

European Open Badges Platform (EU-OBP).

<http://eu-obp.eu/>



European Open Badges Platform, funded under the Erasmus+ program of the European Commission, wants to assess, develop and promote the common EU platform for digital badges, targeted at adult education organizations, adult educators and adult learners that also represent the main target groups. The first result of the project; the reader about the implementation of badges in adult education is now available. Click on the image to read the full document in English, German Spanish, Romanian, Slovenian, French, Greek and Swedish.

OPening cultural HERitage to communities during the central-Italy post-earthquake long-term restoration process: digital technologies and new competencies for cultural professionals (OPHERA).



<https://ophera.beniculturali.it/>

OPHERA-OPening cultural HERitage to communities during the central-Italy post-earthquake long-term restoration process: digital technologies and new competencies for cultural professionals.

Cultural heritage damaged due to natural disasters, represents a loss of artistic and historical materials and in the same time is an immaterial loss of memory and people identity. One of the most impacting events both on communities and on cultural heritage was the 2016/2017 Central-Italy earthquake.

In Marche Region, the most affected territory, 1664 historical listed churches and 1223 listed buildings (including castles, palaces and archaeological areas) were damaged or destroyed. From those listed buildings more than 13000 movable artworks with different levels of damage were removed and stored in temporary conservation centres. In terms of landscape impact, 285 historical villages were damaged.

The OPHERA project concept is based on the awareness that the restoration of this cultural heritage is a long-term process, and will be therefore dedicated to the next generations. The project idea is therefore to make accessible part of the damaged cultural heritage and cultural-artistic contents associated to the restoration activity throughout the restoration process by mean of traditional and advanced interactive methods and tools. OPHERA project aims to reveal the restoration process cultural values, which are characterized by a rich pattern of skills and creative steps usually shared among restoration professionals (architects, artwork restorers, researchers, art managers, historians) including the most advanced technologies about preventive methods for heritage conservation in order to increase the people culture of prevention.

The project, through the training of a European team of cultural operators and artists and the organization of two Open-yards events in the restoration sites, aims to foster a cultural exchange between restoration professionals and a wider audience represented by citizens, visitors, local administrators, students, cultural association in order to transform the restoration process in a cultural event.

IMproving Sustainable Development Policies and Practices to access, diversify and foster Cultural TOURism in European regions and areas (IMPACTOUR).



<https://www.impactour.eu/>

The EU-funded IMPACTOUR project is connecting Cultural Tourism stakeholders and researchers, envisaging new approaches and methods that will support European Cultural Tourism, reinforce a feeling of belonging, value minority cultures and promote Europeanisation. The project will elaborate on an advanced and adaptable methodology to estimate the impact of Cultural Tourism on EU regional economic growth. It will combine data analytics algorithms with machine learning and AI approaches to improve policies and actions on Cultural Tourism.

Europeana Common Culture.

<https://pro.europeana.eu/project/europeana-common-culture>



Europeana Common Culture, lasting throughout 2019 and 20, has aimed to develop a harmonised and coordinated environment for Europeana's national aggregators of digital cultural heritage, collaborating, share resources and technical means, agreeing on common recommendations and standards and improving the quality of content and four million metadata records to increase user satisfaction. Experiments in semantic enrichment have been conducted to improve discoverability and indexing of Europeana records in order make them better findable and useful. An innovative pilot for a Linked Open Data Aggregator (LODA) data demonstrate is also being concluded. In its role as an Activity Leader, CUT has contributed through coordinating a rich programme of training webinars in order to increase awareness of Europeana and capacity building in the cultural sector. A wide-ranging survey of digital heritage crowdsourcing activities across Europe and their future potential within the Europeana ecosystem has also been conducted by CUT.

Europeana Archaeology.

<https://europeanaarchaeology.carare.eu/>



The Europeana Archaeology project, which ran from February 2019 until October 2020, aimed to increase the amount of high-quality digital content for Europe's rich heritage of archaeological monuments, historic buildings, cultural landscapes and artefacts that is accessible online through Europeana and available for reuse. During the project, partners enriched the quality of existing collections, added new collections and carried out targeted digitisation. Work to map vocabularies and to increase the use of multilingual Linked Open Data has helped to raise the quality of the metadata and provided a set of services for archaeology available to Europeana aggregators and content providers. The content provided by the project is directly available to users through Europeana's Archaeology thematic collection. The project is led by the University of Vilnius. As a partner, Cyprus University of Technology has contributed with a presentation of the cultural wealth of Byzantine church of Asinou, namely its frescoes. Also the Digital Heritage Research Lab successfully enriched the quality of digital content of Europeana by creating 3D models for two of Asinou church's icons, namely the icon of Virgin Mary, known as the *Asinou icon*, and the icon of John the Baptist. Finally, Cyprus University of Technology has contributed to the promotion of the archaeological discipline with one of the most important photographs in Europe related to the excavation process the discovery of 'Horned God' in Enkomi by Porphyrios Dikaio.

RESEARCH INFRASTRUCTURES

CLARIN - European Research Infrastructure for Language Resources and Technology - CYPRUS



<https://www.clarin.eu/>

CLARIN stands for "Common Language Resources and Technology Infrastructure".

It is a research infrastructure that was initiated from the vision that all digital language resources and tools from all over Europe and beyond are accessible through a single sign-on online environment for the support of researchers in the humanities and social sciences.

In 2012 CLARIN ERIC was established and took up the mission to create and maintain an infrastructure to support the sharing, use and sustainability of language data and tools for research in the humanities and social sciences. Currently CLARIN provides easy and sustainable access to digital language data (in written,

spoken, or multimodal form) for scholars in the social sciences and humanities, and beyond. CLARIN also offers advanced tools to discover, explore, exploit, annotate, analyse or combine such data sets, wherever they are located. This is enabled through a networked federation of centres: language data repositories, service centres and knowledge centres, with single sign-on access for all members of the academic community in all participating countries. Tools and data from different centres are interoperable, so that data collections can be combined and tools from different sources can be chained to perform complex operations to support researchers in their work.

DIGITAL RESEARCH INFRASTRUCTURE FOR THE ARTS AND HUMANITIES - CYPRUS



<http://www.dariah-cy.eu/>

DARIAH Cyprus is the Cypriot Digital Research Infrastructure for the Arts and Humanities, which aligns its activities with those of the central European Digital Research Infrastructure for the Arts and Humanities DARIAH-EU (www.dariah.eu), to which Cyprus is a member state. DARIAH-EU is one of the 12 largest research infrastructures of the European Research Infrastructure Consortia (ERIC) which aims to promote and support Arts and Humanities sector on a research level. As member of this European research network, Digital Heritage Research Laboratory, dedicated to the research on the specific areas of digitization, archiving and promotion of tangible and intangible Cultural Heritage, as well as to the modelling of knowledge, actively contributes to the infrastructure of DARIAH-EU, and highlights Arts and Humanities through Culture.

INTERNATIONAL ORGANISATIONS

▪ PHOTOCONSORTIUM



PHOTOCONSORTIUM

www.photoconsortium.net

International association spin-off of Europeana Photography project, a thematic aggregator about early photography that digitized and made accessible online nearly half a million historic photographs. Within the legacy of Europeana Photography, Photoconsortium is also the curator of the travelling exhibition All Our Yesterdays.

■ CARARE ASCOSIATION

www.carare.eu

CARARE aims to advance professional practice and foster appreciation of the digital archaeological and architectural heritage through the promotion for public benefit of digitisation, connection. Enhancement, and use of digital content nationally and internationally. It supports the creation, connection, enhancement and use of digital archaeological and architectural heritage resources, for work, research, learning and for enjoyment



■ MICHAEL CULTURE ASSOCIATION

<http://www.michael-culture.eu/>

Michael Culture Association constitutes a non-profit organization that supports European and national cultural policies by gathering a strong network of more than 100 public and private organizations from all over Europe.



■ EUROPA NOSTRA

<http://europanostra.org>

Europa Nostra was founded on 29 November 1963 in Paris. For over 50 years, we have celebrated, protected and lobbied for cultural heritage. Europa Nostra is today recognised as the most representative heritage organisation in Europe with members from over 40 countries.



■ Marie Curie Alumni Association - Cyprus Chapter

<https://www.mariecuriealumni.eu/groups/cyprus-chapter>

The group has been created to bring closer all the Marie Curie fellows and Alumni that live in the geographical area of Cyprus under a common goal, to enhance the image of the MCAA within the Cypriot territory.



WORKSHOPS

Workshop1 - The 2nd EU Workshop on how digital technologies can contribute to the preservation and restoration of Europe's most important and endangered Cultural Heritage sites.

This unique event will develop the outcomes of the previous EU-supported workshop at EuroMed2018, drawing on important policy developments which have occurred meanwhile, including:

1. The publication of the EU H2020 ViMMuseum Manifesto, Roadmap and Action Plan (**#ViMMuseum_Manifesto**, **#ViMMuseum_ActionPlan**, **#ViMMuseum**).
2. The Declaration of Cooperation on advancing digitisation of cultural heritage signed by EU Member States at the EU Digital Day 2019 (**#DigitalDay2019**).
3. Recent guidance such as the Basic principles and tips for 3D digitisation of cultural heritage compiled by Expert Group on Digital Cultural Heritage and Europeana (**#EU_Study_3D_CH**, **#DCHE_Group**).

The event will also provide an opportunity for stakeholders and all those interested to learn about and contribute to a major new study on Quality in 3D digitisation of tangible Cultural Heritage under an EU tender recently awarded to Digital Heritage Research Laboratory at UNESCO Chair on DCH at the Cyprus University of Technology.

Moreover, this key workshop will focus on identifying parameters for quality and complexity in 3D data acquisition, modelling, e-preservation and standardisation as well as:

- Which technologies need to be developed to allow the creation of a digital replica, which must be of such definition and detail to enable their use for research and future preservation and reconstruction of damaged artefacts or sites?
- Which standards need to be agreed upon, so that the digitized material will be accessible (long term) to all through a single access point, also providing access to complementary material (images, books, descriptions, drawings) illustrating the cultural and historic significance of the sites.
- Which algorithms have to be developed for the holistic documentation of the past (tangible and intangible): Story, Memory, Knowledge, Identity, etc.

 <p><u>2nd EU Workshop on how digital technologies can contribute to the preservation and restoration of Europe's most important and endangered Cultural Heritage.</u></p>		
Eastern European Time (CY Time)	Monday 02/11/2020	
09:00-09:30	Opening Ceremony Marinos Ioannides , UNESCO Chair on Digital Cultural Heritage, Panayiotis Zaphiris , Rector of Cyprus University of Technology, Mrs. Isabelle Anatole-Gabriel , Chief of the Europe and North America Unit, UNESCO World Heritage Centre, Mrs. Anne Bajart , European Commission, Deputy Head of Unit – DG- Connect/Unit G.2 Grellan Rourke , Vice President for Europe of International Council on Monuments and Sites (ICOMOS), Chrysanthos Pissarides , President, ICOMOS - CYPRUS, Harry Verwayen , Executive Director, Europeana	
	Name	Title of Presentation
09:30-10:00	Dr. Christoph Fröhlich, Christoph Held, Zoller & Fröhlich GmbH, Germany	<i>TLS Documentation of Tangible Cultural Heritage - Challenges and Solutions</i>
10:00-10:30	Martin Schaich, ArcTron 3D GmbH, Germany	<i>The "hen-egg" metaphor in CH: what comes first budget or task? Three exemplary projects from archaeology and monument conservation</i>
10:30-11:00	Coffee Break	
11:00-11:30	Prof. Isto Huvila, Uppsala University, Sweden	<i>What all is (not) paradata? Documenting the making and provenance of archaeological and heritage information</i>
11:30-12:00	Prof. Petros Patias, Aristotle University of Thessaloniki, Greece	<i>Object Complexity vs. Model Complexity</i>
12:00-12:30	Prof. Roko Žarnić, Prof. Vlatka Rajčić, Bene Construere, Croatia	<i>Identification of complexity and quality in 3 D documentation by the significances of Cultural Heritage assets</i>
12:30-13:00	Alastair Rawlinson, Historic Environment Scotland	<i>Addressing Complexity and Quality in the Digital Documentation of Immovable Cultural Heritage: The Forth Bridge UNESCO World Heritage Site Case Study</i>
13:00-14:00	Lunch	
14:00-14:30	Prof. Andreas Georgopoulos, Prof. Charalabos Ioannidis, National Technical University of Athens	<i>The impact of monument complexity and data quality on the documentation of tangible Cultural Heritage</i>

14:30-15:00	Prof. Raffaella Brumana, Polytechnic University of Milan, Italy	<i>Building and sharing knowledge from quality driven content models</i>
15:00-15:30	Herbert Maschner, Global Digital Heritage, USA	<i>3D Documentation of Tangible Cultural Heritage: From Scarab Seals to Ancient Cities with the NGO Global Digital Heritage</i>
15:30-16:00	Coffee Break	
16:00-16:30	Prof. Sander Münster, Time Machine Organisation	<i>Big Data of the Past - Building Blocks towards a virtual Time Machine</i>
16:30-17:00	Ronald Haynes, Cambridge University, UK Edward Silvertown, Mnemoscene, UK	<i>IIIF 3D: Complementing IIIF 2D & AV standards with 3D interoperability and sustainability</i>
17:00-17:30	Dr. Rebecca Dikow, Smithsonian Institution, USA	<i>Data-intensive approaches to digitized museum collections</i>
17:30-18:00	Coffee Break	
18:00-18:30	Carla Schroer, Director of Cultural Heritage Imaging, USA Prof. Doug Boyer, Duke University, USA	<i>Documenting and displaying workflows for 3D digital preservation: MorphoSource and CHI's Digital Lab Notebook</i>
18:30-19:00	Patricia Harpring, Getty Research Institute, USA	<i>Vocabularies for Access to History and New Knowledge: Focus on the Getty Vocabularies</i>
19:00-20:00	Discussion/Final Conclusions Chair: Dr. Marinos Ioannides	
20:00	End of Workshop	

Workshop2 - The 5th International Workshop on 3D Research Challenges in Cultural Heritage to be organized by the EU H2020 ERA Chair Mnemosyne project.

This event will focus on:

In recent years, the approaches towards 3D geometry has seen rapid progress in many different areas from digital factories of the future, to car, flight and surgical training simulators to 3D maps, 3D TV/Cinema and games but also in Cultural Heritage applications. In general, the handling of 3D data poses different challenges but also provides new, exciting and innovative opportunities compared to more established media like texts, images or sound. The goal of this workshop is to present a selection of recent advances, some of which are already used in the cultural heritage domain while others have a high potential for it. The topics will be presented with the goal to take into account how these 3D technologies could be used in Digital repositories for Cultural Heritage (like Europeana, www.europeana.eu), where they could open up far-reaching new opportunities for re-use. Consequently, the workshop will be concluded by a panel discussion including both 3D experts as well as representatives from Digital Libraries and Cultural Heritage Management Systems on 3D potential and future directions.

 <p><u>The 5th International Workshop on 3D Research Challenges in Cultural Heritage to be organized by the EU H2020 ERA Chair Mnemosyne project.</u></p>  		
Eastern European Time (CY Time)	Tuesday 03/11/2020	
09:00-09:30	Prof. Kyriakos Efstathiou, <u>ERA Chair on Digital Cultural Heritage, Cyprus</u>	<i>The ERA Chair project MNEMOSYNE in Digital Cultural Heritage</i>
09:30-10:00	Prof. Gabriele Gattiglia, <u>University of Pisa, Italy</u> Francesca Anichini, <u>MAPPALab, Italy</u>	<i>As quality as possible, messy as necessary. Artificial Intelligence, Big Data and data quality.</i>
10:00-10:30	Angie Judge, <u>Chief Executive Officer, Dexibit Ltd, New Zealand</u>	<i>Data transformation for the cultural sector for recovery.</i>
10:30-11:00	Coffee Break	

11:00-11:30	Kate Fernie, 2Cuture Associates Ltd, UK and Connecting Archaeology and Architecture in Europe, Ireland	<i>3D content in Europeana: the challenges of providing access</i>
11:30-12:00	Prof. Ioanna Kakoulli, University of California, Los Angeles USA	<i>How materials science and engineering is forging a new path in holistic documentation of Cultural Heritage</i>
12:00-12:30	Prof. Nenad Tasic, University of Belgrade, Serbia	<i>Type-site vs. landslide and how can 3D data help? Case study Vinča</i>
12:30-13:00	Dr. Alexis Tourtas, University of Aegean, Greece	<i>3D documentation for Underwater Cultural Heritage</i>
13:00-14:00	Lunch	
14:00-14:30	Ass. Prof. Costas Papadopoulos, Maastricht University, Netherlands	<i>PURE3D: Towards 3D Scholarly Editions</i>
14:30-15:00	Ralf Schäfer Fraunhofer Heinrich Hertz Institute, Germany	<i>Volumetric Video and its Application to Archive the Memory of Contemporary Witnesses</i>
15:00-15:30	Johanna Leissner Fraunhofer-Gesellschaft, Germany	<i>Innovations from Fraunhofer to protect Cultural Heritage – Novel consolidated 3D damage and materials analysis</i>
15:30-16:00	Dr. Oonagh Murphy, Goldsmiths University of London, UK	<i>AI, ethics and museums - a complex web or a crucial opportunity?</i>
16:00-16:30	Coffee Break	
16:30-17:00	Dr. Robert Sanderson, Alison Clemens (Head of Processing), Yale University, USA	<i>Libraries, Archives and Museums are not Neutral: Working Toward Eliminating Systemic Bias and Racism in Cultural Heritage Information Systems</i>
17:00-17:30	Elizabeth Lee, CyArk, USA	<i>Open Heritage 3D: making primary 3D Cultural Heritage data open and accessible</i>
17:30-18:00	Annabel Lee Enriquez, Getty Conservation Institute, USA	<i>Arches Cultural Heritage Data Management Platform: A System for All Use Cases</i>
18:00-18:30	Coffee Break	
18:30-19:00	Todd Swanson, J. Paul Getty Trust, USA	<i>Building and Supporting Getty's Technical Imaging Capability</i>
19:00-20:00	Discussion/Final Conclusions Chair: Prof. Kyriakos Efstathiou	
20:00	End of Workshop	



Prof. Kyriakos Efstathiou,

ERA Chair Mnemosyne – Cyprus University of Technology

Kyriakos Efstathiou, a Cypriot citizen, is the holder of the ERA Chair on Digital Cultural Heritage at the Digital Heritage Research Laboratory, Cyprus University of Technology. Kyriakos holds a PhD Degree from the Department of Mechanical Engineering at the Aristotle University, Thessaloniki (Greece) and was for 37 years a researcher and Professor there, serving as Director of the Laboratory for Machine Tools and Manufacturing Engineering, and Director of the Design and Construction Department. He was the Leader of the Aristotle University research team, which investigated the Antikythera Mechanism, the first analogue computer in the human history. He has published more than 100 papers in international Scientific Journals and Conference proceedings and has a long experience on the investigation of archaeological objects and reproduction of accurate replicas, rapid prototyping, reverse engineering, X-ray and neutron tomography, Machine tools, manufacturing technology, CNC technology, CAD/ CAM systems, CIM systems. He investigated and manufactured exact replicas of archaeological findings such as the vaginal speculum of Dion, digitized the West Freeze of the Parthenon etc., and has organized related exhibitions.

PRESENTATION TITLE: The ERA Chair project MNEMOSYNE in Digital Cultural Heritage

ABSTRACT:

Digitisation of cultural heritage is a crucial tool in today's efforts towards the protection, conservation, study and promotion of Europe cultural resources. At the European Union level, new actions are being taken in this area; for example, the European Commission's Declaration of Cooperation on Advancing Digitisation of Cultural Heritage (the so called DigitalDay2019 declaration), which demonstrated the commitment of the EU member states to take action in several areas, including a pan-European initiative for 3D (tangible) digitisation of cultural heritage artefacts, monuments and sites as well as the corresponding holistic documentation.

The main goal of the ERA Chair MNESONYNE project on Digital Cultural Heritage (DCH) is to accomplish a unique research agenda on Cultural Informatics focusing on the holistic documentation of Cultural Heritage, in support of existing and potential user needs. The research challenges cover the DCH lifecycle, including the areas concerning: Data acquisition (tangible / storytelling and untold stories), Data processing (intangible heritage, enrichment of metadata), Knowledge Modelling (semantics and ontologies), Knowledge management (interpretation), Preservation and Use and Re-use.

The MNEMOSYNE project aims to achieve the following:

- A holistic framework for DCH by carrying out the wide range of collaborative and multidisciplinary research needed within an overall construct of advanced documentation.
- Creation of a centre of excellence in DCH.
- Development of an e-learning Master Course in Cultural Informatics.
- Establishment of research collaboration agreements with other academic, research, innovation and stakeholder institutions.



**Gabriele Gattiglia - Professor in Archaeological
Method and Theory at University of Pisa, ITALY**

Gabriele Gattiglia is an Assistant Professor in Archaeological Method and Theory at the University of Pisa, Italy. His fields of interest are data analysis, urban archaeology, GIS, open data, and Artificial Intelligence applications in Archaeology. He has been PI (2007 – 2015) of the archaeological project “Castle of Montecastrese and Medieval Versilia Project”. He conducted as director 12 archaeological excavations, four archaeological surveys, and took part in more than 100 archaeological excavations. He coordinated the H2020 ArchAIDE Project (www.archaide.eu).



Francesca Anichini - MAPPALab, ITALY

Field archaeologist (and not), project & communication manager, she is passionate about methodological issues, devoted to the Open philosophy and in love with contemporary archaeology. Francesca is one of the founders of MAPPALab, where she has been working since 2010. Moreover, Francesca is one of the creators and developers of MAPPA, ArchAIDE, MAGOH and MOD (MAPPA Open Archaeological archive) projects. She edited the DataBook series and teaches “Design and communication of European projects in Archaeology” at the Specialization School in Archeology of the University of Pisa.

PRESENTATION TITLE: As quality as possible, messy as necessary. Artificial Intelligence, Big Data and data quality.

ABSTRACT:

Artificial Intelligence applications in Archaeology and more in general in Cultural Heritage are becoming more and more common. Until a few years ago, machine learning algorithms and neural network were concepts unknown to archaeologists; now, they are ordinary in archaeological conferences. Despite popular mythology, one of the most complex aspects of building a neural network is not the algorithm itself, but the data. The training of AI algorithms needs data, possibly Big Data. Vast amounts of data are often unavailable in CH. What CH experts think as massive is probably not enough for AI. So if we need Big Data, we have to compromise with messy data. Many scholars suggest that archaeology is perfect for Big Data because archaeological data are messy and difficult to structure by definition.

Nonetheless, should we renounce to quality data? Solutions for establishing practices and encoding the evaluation of data quality through metadata enrichment are already available. Besides, data quality could be guaranteed archiving data in consolidated open data repositories, and digital techniques can mine existing data collections to highlight anomalies and verify the quality of data. In the end, is it utopia hoping in big quality data?



Angie Judge - Chief Executive Officer, Dexibit Ltd, NZ

A kiwi technology entrepreneur with a background in computer science, Angie leads an award winning team at Dexibit, the company she founded to transform decision making for visitor attractions. Angie is the Chair of the American Alliance of Museum's Technology Board, former Chair of the MCN's Data & Insight Group, cohost of a tourism analytics think tank network and host of the Data Diaries podcast. In 2019, Angie was awarded the Inspiring Women Leaders award from the International Business Awards and in 2018, awarded the business and enterprise Women of Influence. She developed her passion for analytics in the telecoms industry with a prior corporate career at Hewlett Packard and Amdocs. In her spare time, Angie mentors young women into technology careers, lecturers in data science and is a keen water skier.

PRESENTATION TITLE: Data transformation for the cultural sector for recovery

ABSTRACT:

In the face of COVID-19, museums with a strong data foundation found themselves at a significant advantage in responding to the crisis - empowering lean and agile teams to make rapid, insight informed decisions. As museums reopen and face a collective recovery journey across the global sector, the role of data and AI has focused on 10 core challenges of museum management to ensure safe and happy visitors, financially sustainable organizations and the growth required to return; along with paradigm shifts in what leadership teams need to navigate data literacy and new ways for the industry to collaborate and share data. In this presentation, Angie reflects on the foundations gained over the last few years, the innovation needed for 2020 and the future ahead for big data analytics in museums



**Kate Fernie, 2Culture Associates Ltd, UK -
Connecting Archaeology and Architecture in
Europe, Ireland**

Kate Fernie is an experienced professional with a background in Archaeology, museums, information management, standards and digitisation in the cultural heritage sector. She is director of 2Culture Associates Ltd., and operations manager for the CARARE association. Kate was project manager for the EU funded PATHS, LoCloud and CARARE projects. She participates in the Europeana service infrastructure and the ARIADNE research infrastructure on behalf of the CARARE association and was leader of the Europeana Network Association's task force on 3D content in Europeana. Her previous experience includes working as Digital Preservation Officer at the UK's Parliamentary Archives, ICT Advisor at the Museums, Libraries and Archives Council and Heritage Information Partnerships officer at English Heritage. She has produced online learning resources, edited best practice guidelines and coordinated networks. Her qualifications include a B.A. in Archaeology and Anthropology from Cambridge University, an M.A. in Museum Studies from Leicester University and a M.Sc. in Applied Landscape Archaeology from Oxford University.

PRESENTATION TITLE: 3D content in Europeana: the challenges of providing access

ABSTRACT:

Europeana is an online platform that provides access to millions of items of digital content from Europe's museums, galleries, libraries, archives and research institutions. Although 3D documentation has become more common in recent years, the majority of the content accessible via Europeana comprises of images and text documents. This paper describes the context and general challenges of making 3D content accessible online, and the specific challenges for Europeana. The creation of highly accurate 3D models of monuments, buildings and museum objects has become more widespread in research, conservation, management and to provide access to heritage for education and tourism. Yet this is still a developing field and organisations that are commissioning 3D media need to make a series of choices on the type of content that is created, how it will be visualised online and for which users. The challenges of storing and providing access to this content include the multiplicity of content types and formats, the technology requirements and limitations faced by different audiences, and issues such as low standardisation, the complexity and volumes of data involved, interoperability, and lack of metadata. Working collaboratively in developing standards for 3D content formats and metadata will increase interoperability, improve access, storage and preservation of 3D media.



Prof. Ioanna Kakoulli, University of California, Los Angeles, USA

Dr. Ioanna Kakoulli is a professor in the Department of Materials Science and Engineering and co-Director of the Molecular and Nano Archaeology Laboratory and holds joint appointment with the Conservation and Archaeology Interdepartmental Programs at the University of California Los Angeles. She is also adjunct professor at the University of Cyprus. Professor Kakoulli received her doctorate degree (D.Phil.) from the University of Oxford in archaeological materials science and archaeological chemistry. As a professor in the Department of Materials Science and Engineering at UCLA, she consolidated and expanded research areas in archaeological materials science and forensics through multi-scale multimodal imaging and spectroscopy to infer ancient production technology and the identification of fingerprint markers of undocumented archaeological artifacts. Her research efforts created new international interdisciplinary collaborations and have yielded important peer-reviewed publications. She was awarded the inaugural "Visiting Professorship in Archaeological Materials Science" at MIT and served in the Board of Trustees of the Cyprus American Archaeological Research Institute (CAARI), as scientific consultant for UNESCO, expert witness for Homeland Security and scientific foreign expert for the International Atomic Energy Agency (IAEA).

PRESENTATION TITLE: How materials science and engineering is forging a new path in holistic documentation of cultural heritage

ABSTRACT:

A holistic approach to the documentation of tangible cultural property encompasses the analysis and recording of materials both as cultural biographies and physical evidence. Here we highlight the importance of how the analysis and assessment of materials' properties (optical, physical and chemical) and condition (patina, accretions, and erosion) related to the age and environment to which material culture was subject to, could contribute to recognizing the biography of an object or monument through time and space. Three major research areas of materials science are presented to help integrate materials engineering principles and methods with documentation practices thus forging a new path in the holistic documentation of cultural heritage: (1) reverse engineering and analysis of cultural heritage

materials within their cultural context, value, function, and significance to identify materials and technological choices, the relationships of such choices to human agency and society, and determination of production events; (2) improvements in the detection of diagnostic markers in the field of cultural heritage forensics for authentication and provenance of looted and stolen cultural objects; and (3) monitoring change of material culture impacted by environmental and anthropogenic events.



Prof. Nenad Tasić, University of Belgrade, Serbia

Dr. Nenad N. Tasić is a professor at the Department for Archaeology, Faculty of Philosophy, University of Belgrade. The professional and scientific interests which have marked his career are Neolithic of South-eastern Europe, Radiocarbon dating, Methodology of archaeological research, Informational technologies in archaeology and heritage management, Digital archaeological field documentation, Geophysics in archaeology, Popularization of science and cultural heritage, Virtual reconstruction in archaeology and Heritology. During his scientific career Dr. Nenad N. Tasić has published more than a hundred scientific papers, treatises, reviews, exhibition catalogues, chapters in monographs, and books. His work was published in *Antiquity*, *Germania*, *Radiocarbon*, *Quaternary International*, *Documenta Praehistorica*, and other prominent publications; also he has taken a part in many international projects.

PRESENTATION TITLE: 3D content in Europeana: the challenges of providing access

ABSTRACT:

The site of Vinča is situated 14 km downstream from Belgrade on the right bank of the Danube and is best known for its Neolithic layers dated between 5800 and 4500 BC. The site itself has the shape of a tell and was occupied with some intermissions from the Middle Neolithic to the present day. Vinča's 10 meters thick cultural deposit has since its discovery represented a yardstick for comparison of different aspects of material cultures and events in the Central and West Balkans and parts of Central Europe. Archaeological excavations at Vinča began at the onset of the 20th century and have been carried out, with some gaps until the present day. The present one began its work here in 1998 with a specific goal: To modernize archaeological field documentation in Serbia, applying advanced methodologies and procedures in fieldwork at the site of Vinča and collect as much meaningful data as possible. In 2019 we started rescue excavations at the part of the site which was endangered by a landslide. Our aim was to excavate and document the part of the site which has slipped and is not on its original place. Due to the landslide, the entire section of the site (100 by 50 meters) has sunken between 0.7 m and almost 9 m. At first, it appeared that stratigraphical data collected from this part of the site will be probably useless for analysis and comparison with the part of the site which was not moved by the landslide. After a series of research procedures performed to inspect the subsurface of the site (electric tomography, GP radar, geo-elastic waves and coring) have learned that the cultural layers were slipping off together in a predictable way. Using all the 3D models and other relevant information collected during surveys and excavations at the site, we have decided to perform digital reconstruction of the original position of each part of the site and lift it to the position where it used to be before this landslide occurred. To check the result of this digital endeavor, we have an ample collection of radiocarbon dates (more than 220) from the site for comparison purposes.



Dr. Alexis Tourtas, University of Aegean, Greece

Alexandros Tourtas is a postdoc researcher at FORTH-IMS and the University of Aegean and teaches subjects of Maritime Archaeology as adjunct faculty in the Department of History, Archaeology & Social Anthropology of the University of Thessaly. He has taken part in various land and maritime archaeological projects, specializing in the implementation of advanced technologies in the archaeological process and the management of sites. He is also an experienced diver, with high standard qualifications (TMX, CCR, OWSI) and holds a Scientific Diver Certification from Woods Hole Oceanographic Institution (AAUS).

PRESENTATION TITLE: 3D documentation for Underwater Cultural Heritage

ABSTRACT:

Three-dimensional documentation is a vital procedure when it comes to matters of managing material evidence from the past. Starting from research in the field and the interpretation of archaeological evidence and moving to protection strategies and the production of attractive and scientifically accurate cultural products for the public, efficient documentation methodologies require well designed tools for depicting sites, artifacts and other kinds of data. Especially in the case of Underwater Cultural Heritage (UCH), where access to the actual sites is often denied, due to the nature of the underwater environment. Efficient documentation means being able to remotely access the sites and their materials, a fact that becomes a crucial commodity both for research and public interaction reasons. Technology of course is the main driving force for the development of such tools. Therefore, the expansion of available equipment and relevant methodologies in the recent decades is impressive, delivering a great number of devices. Specially designed cameras and sensors, advanced software, remotely operated and automated vehicles etc. are becoming increasingly available to cultural management projects and the data produced by these procedures are slowly accumulating in order to be accessible by scientists and the public. In this presentation you will receive an overview of the available methods for underwater documentation of cultural heritage, along with examples of successfully implemented UCH documentation projects.



Maastricht University **Ass. Prof. Costas Papadopoulos,**
Maastricht University, Netherlands

Dr Costas Papadopoulos is an Assistant Professor in Digital Humanities & Culture Studies at Maastricht University, Netherlands. His research spans the development of virtual worlds to interpret societies of the past, to the application of computational imaging to analyse material culture, to the use of digital ethnographic methods to evaluate digital pedagogy and interactive teaching methods. Much of his scholarship focuses on heritage visualisation using a variety of 2D and 3D media. He is PI of 'PURE3D: An Infrastructure for the Publication and Preservation of 3D Scholarship' and Co-PI of '#dariahTeach: An Open Educational Resource for the Digital Arts & Humanities' (<https://teach.dariah.eu/>) and 'IGNITE: Design Thinking & Making in the Arts & Sciences' (<https://ignite.acdh.oeaw.ac.at/>). He holds an MSc in Archaeological Computing (Virtual Pasts) and a PhD in Digital Archaeology from the University of Southampton.

PRESENTATION TITLE: PURE3D: Towards 3D Scholarly Editions

ABSTRACT:

Three-dimensional documentation is a vital procedure when it comes to matters of managing material evidence from the past. Starting from research in the field and the interpretation of archaeological evidence and moving to protection strategies and the production of attractive and scientifically accurate cultural products for the public, efficient documentation methodologies require well designed tools for depicting sites, artifacts and other kinds of data. Especially in the case of Underwater Cultural Heritage (UCH), where access to the actual sites is often denied, due to the nature of the underwater environment. Efficient documentation means being able to remotely access the sites and their materials, a fact that becomes a crucial commodity both for research and public interaction reasons. Technology of course is the main driving force for the development of such tools. Therefore, the expansion of available equipment and relevant methodologies in the recent decades is impressive, delivering a great number of devices. Specially designed cameras and sensors, advanced software, remotely operated and automated vehicles etc. are becoming increasingly available to cultural management projects and the data produced by these procedures are slowly accumulating in order to be accessible by scientists and the public. In this presentation you will receive an overview of the available methods for underwater documentation of cultural heritage, along with examples of successfully implemented UCH documentation projects.



Fraunhofer

Heinrich Hertz Institute

Ralf Schäfer, Fraunhofer Heinrich Hertz

Institute, Germany

Ralf Schäfer is Director of the Video Division at Fraunhofer Heinrich Hertz Institute (HHI) in Berlin where he is responsible for 100 researchers and 50 undergraduate students. He studied electrical engineering at the Technical University Berlin (TUB) and joined HHI as a researcher in 1977. In 1984, he received his doctorate at TUB in the area of digital video coding of TV signals. His research interests cover all areas related to images and video, from acquisition to display and from algorithm development to ASIC implementation. Besides his role as Division Director, he is responsible for three technology centers, the “CINIQ Center for Data and Information Intelligence” (<http://www.ciniq.de>), the Innovation Center for Immersive Imaging Technologies - 3IT (<http://www.3it-berlin.de>) and Tomorrow’s immersive Media Experience (TiME) Lab (<http://www.timelab-hhi.com>), where smart data solutions and immersive.

PRESENTATION TITLE: Volumetric Video and its Application to Archive the Memory of Contemporary Witnesses

ABSTRACT:

Recent advances in volumetric capture technology have started to enable the creation of high-quality 3D video content for free-viewpoint rendering on VR and AR glasses. This allows highly immersive viewing experiences, because the natural mimic and gestures of a person are preserved, while computer generated avatars still lack naturalness, which leads to the so-called Uncanny Valley effect. We use this technology to archive the memory of contemporary witnesses, which in our case is one of the last German survivors of the Holocaust. In this paper we will explain the basic principles of volumetric video capture and processing and present some results of a recent production, in which a young person interviews the Jewish contemporary witness about his experience in Nazi Germany and his imprisonment in the concentration camp Theresienstadt.



Fraunhofer Gesellschaft, Germany

Johanna Leissner, Fraunhofer

Trained as chemist in Germany and USA. She is working in cultural heritage research for over 20 years with a focus on climate change, environmental pollution, environmental sensor development and sustainability issues like Green Museums.

She is a member of the EU expert group “Cultural Heritage Forum” established in 2019. Coordinator of EU large scale project “Climate for Culture” (www.climateforculture.eu), EU project “Assessment and monitoring the environment of cultural property” and of the Fraunhofer projects “Virtual Heritage Expo” and “Impacts of climate change and chances of digitalisation in cultural heritage”. She was partner in many other EU funded projects (Erasmus + project CultHer (Professional training courses in North Macedonia on conservation and preservation of the built heritage from climate change influences); EU CHIC (Cultural Heritage Identity Card); EU ERA Net “Netheritage”). German delegate for the Council of Europe Strategy “European Cultural Heritage in the 21st century” and of the UNESCO World Heritage Expert Group for climate change impacts on cultural heritage. Since 2005 scientific representative for Fraunhofer-Gesellschaft at the European Union in Brussels. Co-founder of the German Research Alliance for the Protection of Cultural Heritage in 2008 and of the Fraunhofer Sustainability Network. From 2001 to 2005 National Expert of the Federal Republic of Germany responsible for “Technologies for the Protection of the European Cultural Heritage” in the European Commission in Brussels.

PRESENTATION TITLE: Innovations from Fraunhofer to protect cultural heritage – Novel consolidated 3D damage and materials analysis

ABSTRACT:

In recent years, the interest in 3D digitization and visualization in the field of cultural heritage has increased due to its manifold potential uses. This is because non-contact and object-friendly scanning in 3D enables new forms of preservation, presentation and interaction with cultural assets and creates new approaches for their exploration. 3D models reproduce the geometry and texture of object surfaces. Initial approaches also attempt to capture the reflection behaviour of various materials. What has not yet been considered, however, is the visual processing of museum objects with information on their interior, material composition and properties as well as on any existing damage (condition assessment). For the first time, innovative Fraunhofer methods have been coupled together, which enable new possibilities of monitoring, analysis and virtual presentation of objects beyond the field of cultural heritage. The aim was to visualize virtual objects and their intrinsic properties. Thereby different technologies have been applied to an object for a consolidated 3D-visualization. Furthermore, the state of preservation was examined by means of optical, electromagnetic and acoustic methods. Selected objects from the Skulpturensammlung Dresden as well as objects from the Freiburg Minster were the focus of the development work.



Dr. Oonagh Murphy - Lecturer in Arts Management at Goldsmiths, University of London, UK

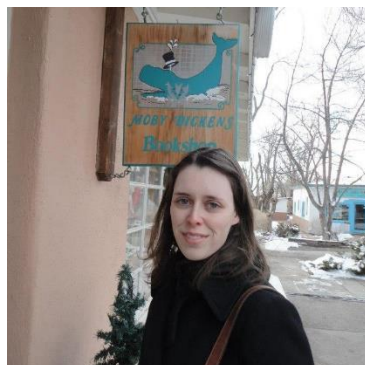
Dr Oonagh Murphy is Lecturer in Arts Management at Goldsmiths, University of London. As an arts manager, writer and lecturer her research has taken her around the world to explore international best practice on the scalability of emerging technologies for cultural organisations. Oonagh is Principal Investigator and co-founder of the Museums + AI Network, which is funded through an AHRC Network Grant. The Network was established in 2019 with Pratt Institute (New York), National Gallery (London) and the Metropolitan Museum of Art (New York). She is a regular contributor to museum sector forums on digital culture, innovation and management, and has been invited to speak at leading cultural centres in the UK, Europe and US, including The Barbican Centre, V&A, National Theatre, the Beledere, New Museum.

PRESENTATION TITLE: AI, ethics and museums - a complex web or a crucial opportunity?

ABSTRACT:

Museums are, by their very nature, data centric institutions. They are collectors and creators of a diverse range of data, be that the bone density of a dinosaur, the market value of an artwork, the most viewed collection item on their website, or how long visitors spend in a particular gallery. AI technologies bring new opportunities and challenges to the collection and analysis of this data, and as such, museums need to create a new model for data management which is socially focused and ethically robust. This is indeed a challenge, and a significant one at that, but museums as an institution offer a unique platform for critical inquiry, and the development of data literacy skills within wider society. Could the museum become a pivotal space for digital enlightenment?

This talk will examine these challenges and possible opportunities through a series of case studies that have been developed through the Museums and AI Network.



Dr. Robert Sanderson – Cultural Heritage Metadata Director, Yale University, USA

Alison Clemens – Head of Processing, Yale University, USA

Dr. Robert Sanderson is the Director for Cultural Heritage Metadata at Yale University, with responsibility for the design and direction of cultural heritage data information standards and systems spanning the collecting divisions of the institution including both art and natural history museums, as well as libraries and archives. His main goal is to find the right balance between ease of publication and consumption of data, and the precision of the data's semantics, with an emphasis on reconciliation of people, places and concepts both within and across organizations. He is one of the driving

forces behind <https://linked.art/>, a community of memory organizations focused on using Linked Open Data to describe cultural heritage objects in a usable, useful way. He is a specification editor and leader in the IIIF community (<http://iiif.io/>), and on the advisory boards of many projects in the cultural sector including the American Art Collaborative and Annotating All Knowledge projects. His previous positions include Semantic Architect for the J Paul Getty Trust, Standards Advocate at Stanford University, Research Scientist at Los Alamos National Laboratory, and a lecturer in Computer Science at the University of Liverpool.

Alison Clemens manages the archival processing program at Manuscripts & Archives (MSSA), a repository at Yale University. At Yale, Alison provides leadership in archival and manuscript description; user experience in special collections; and digital library development and management. She is particularly interested in providing thoughtful and inclusive access to cultural heritage material; uniting library technical services with front line user services; bringing abolitionist perspectives into special collections librarianship; and the ongoing education, development, and support of cultural heritage workers. She is especially proud to have recently published – with her colleagues Jessica Farrell and Brian Dietz – the DLF BDAWG Access Values (<https://osf.io/dzhcp/>). Alison strives to incorporate anti-racist practices in all areas of her work. Alison was previously an archivist at the Beinecke Rare Book & Manuscript Library at Yale University and the Houston and Texas Archives Fellow at the University of Houston. She is an MSIS graduate of the University of Texas at Austin's School of Information and holds a BA in Political Theory from Scripps College.

PRESENTATION TITLE: Libraries, Archives and Museums are not Neutral: Working Toward Eliminating Systemic Bias and Racism in Cultural Heritage Information Systems

ABSTRACT:

Classification systems have been in use long before any digital information management system made them easier to access and apply to the description of cultural heritage. These hierarchical lists of controlled indexing terms provide an "authority" for assigning labels to the heritage that we curate and steward. They are products of human judgement and cognition, and as such also enshrine the biases, power structures, and social constructs of the people and institutions that created and maintain them. These biases can be harmful in our current global milieu, and need to be remediated. Moreover, the description of relationships between objects, people, places and other entities of interest also forcefully position the content according to the view of the cataloger, and not necessarily the culture from which it was taken.

Events in the USA this summer have put cultural heritage into sharp relief against a rapidly changing environment, with museums and other cultural heritage organizations explicitly asserting their commitment to anti-racism. This has been compounded with the COVID-19 pandemic redoubling our emphasis on digital representations as now often the only way of engaging with content. It is with this backdrop that Yale University has started to intentionally and systematically work to identify and eliminate the systemic bias and racism found in our use of terminology, vocabulary and ontology across our cultural heritage units. The work is a fundamental part of a multi-year effort to responsibly share the institutions' content in a cross-collection portal known as LUX.

This presentation will discuss the work in the Yale libraries, archives and museums, united under the banner of the Cultural Heritage/Information Technology Bias Awareness and Responsibility task force, established by the Vice-Provost for Collections and Scholarly Communication. The presentation will outline perspectives regarding anti-oppressive and reparative cultural heritage work and will discuss how the LUX group is incorporating values-based thinking. The presentation will also explore how Linked Open Data can increase transparency of the data and the decisions that went into its creation, and help to remediate terminology without disrupting either ongoing descriptive work or the user interfaces for scholars and the general public to engage with the heritage we steward.



CYARK Elizabeth Lee, Vice President - CyArk, USA

Elizabeth serves as Vice President for Programs and Development for CyArk. Her expertise includes developing international partnerships in support of technology driven solutions for cultural heritage protection, education, and appreciation. Originally trained as an archaeologist with excavation experience in Turkey and Hungary, Elizabeth has been applying 3D technologies to the cultural field for over a decade. She has extensive experience in working with foreign governments and local communities including cultural ministries and the United Nations Educational Cultural and Scientific Organization (UNESCO). Elizabeth is a graduate of the University of California, Berkeley and is a member of the US Chapter of the International Council on Monuments and Sites (ICOMOS). She is a past winner in the South by Southwest (SXSW) Eco Place by Design competition.

PRESENTATION TITLE: Open Heritage 3D: making primary 3D cultural heritage data open and accessible

ABSTRACT: Launched in 2019, Open Heritage 3D is a centralised hub for 3D cultural heritage data published by a variety of academic and cultural institutions from around the world. The platform offers free data downloads to encourage community collaboration and knowledge sharing across the cultural heritage community. CyArk and founding partners Historic Environment Scotland and University of South Florida created Open Heritage 3D to minimize the technical, financial, and legal barriers for publishers of 3D heritage data and to promote discovery and re-use of data sets through standardized metadata and data formats. The platform ensures that the data is available for educational, research, and other non-commercial uses while enabling proper citation and contributor control over licensing. Since launching, Open Heritage 3D has grown to include publishing partners in North America, Europe and Asia and has made over 200 datasets available with thousands of downloads by end users. In this presentation we will discuss the project aims and history as well as the future objectives of the platform.



**The Getty
Conservation Institute**

**Annabel Lee Enriquez - Associate Project
Specialist, Getty Conservation Institute, USA**

Annabel Lee Enriquez is an Associate Project Specialist at the Getty Conservation Institute, where she has specialized in cultural heritage documentation and technology projects since 2013. She manages data modelling and knowledge organization strategy for the Arches project, an open-source software platform for integrated cultural heritage data management. She also provides community training and guidance on Arches and data-related topics, and works directly with GCI partners to better facilitate their respective implementations of Arches for cultural heritage inventories. Currently, she is part of the team for the Arches for Science/DISCO (Data Integration for Conservation Science) project, which involves the customization of the Arches platform for conservation science data integration and management. Prior to her work at the GCI, her research interests revolved around geospatial survey techniques and 3D documentation of heritage sites, and her professional experience includes graphic design and front-end web development. Annabel received a B.S. in Urban and Regional Studies from Cornell University, and an M.S. in Geographic Information Science and Technology from the University of Southern California with graduate work in architectural heritage conservation.

PRESENTATION TITLE: Arches Cultural Heritage Data Management Platform: A System for All Use Cases

ABSTRACT: The Arches Cultural Heritage Data Management Platform has been a project of the Getty Conservation Institute since 2012, and in the past 8 years, the project has grown considerably both in regards to its capabilities and its scope. Initially, the geospatial and semantic software platform was developed to give institutions the ability to manage their own built heritage inventory data according to their specific use case. As the Arches project progressed, more and more features were added to the software to serve both this initial goal and a new goal of managing conservation science data. This resulted in a software platform that can be configured and extended to fit most cultural heritage data management needs, whether it be for built heritage inventories, art provenance, museum objects, or conservation science. Because of this, Arches enables organizations to start their data management projects by forming their own project purpose and data methodology. After giving an overview of Arches, this keynote presentation will focus on the Arches platform's flexibility and the importance of determining a project's purpose and methodology before beginning any data management effort and implementing any software.



**Todd Swanson - Digital Imaging Manager,
J. Paul Getty Trust, USA**

Todd Swanson is currently in the role of Digital Imaging Manager for the J. Paul Getty trust. In this role, Swanson manages, leads and helps develop 2D & 3D Imaging of Cultural Heritage materials and objects in support of the Getty programs (Getty Museum, Getty Research Institute, Getty Conservation Institute and Getty Foundation). He strives to help guide, foster and create sustainable and meaningful data through strategic digitization and digital projects by utilizing and implementing best practises and guidelines and actively exploring new and emerging technologies to help meet the Cultural Heritage Community's current and future needs. Before his current role at Getty, Swanson helped develop and lead a digitization program at the Walt Disney Archives, at the Walt Disney Company. He oversaw 2D and 3D digitization, metadata creation, digital asset managements and digital preservation activities in that role. Swanson holds a B.F.A in Studio art with a focus on Print Making and an M.L.I.S with a focus on "Managements, Digitization and Preservation of Cultural Heritage and Records."

PRESENTATION TITLE: Building and Supporting Getty's Technical Imaging Capability

ABSTRACT:

Getty is a cultural and philanthropic institution dedicated to the presentation, conservation, and interpretation of the world's artistic legacy. Within Art institutions, like Getty, cultural heritage objects are most often explicitly photographed for web use and publication using technology that results in a 2-dimensional rendering in light visible. There exists, however, a class of imaging often referred to as technical and computational imaging, used to support research and analysis that contains multiple modalities of capture existing outside of the "standard" methods. These techniques include 3D Imaging and multispectral capture. In response to the evolving nature of the Cultural Heritage Imaging field, and to support all of the programs at Getty (Museum, Research Institute, Conservation Institute, and Foundation), the implementation of research and development of protocols and best practices for technical and computational imaging is currently being undertaken by the Getty Digital Imaging Department. This collaborative

initiative will leverage the museum and library collections photographers' proficiencies with the Getty Research Institute and Museum Conservation staff as well as the Conservation Scientists' skills.

By combining the Getty's significant expertise in these areas, the Getty will be poised to contribute significantly to the field's knowledge. The goal of this work will be to use advanced imaging tools and techniques to more widely and intentionally generate data sets around the Getty's holdings specifically to meet the needs of the programs and the researchers and public they serve.

This presentation will provide a high-level overview of the Getty Digital Imaging department's initial approach to this work to achieve the above goals.

Workshop3 - Digital Transformation for User Engagement in Cultural Heritage.



High-profile capacity building event

Not-to-be-missed occasion for professionals in the cultural sector to learn about and improve on their ability to engage citizens with cultural heritage content powered by digital technology and tools.

Discussion will be driven by international coaches, who will help participants pull out knowledge and build capacity, discovering replicable methodologies and learning about innovative approaches, with a particular focus on Europeana and the plethora of connected initiatives for supporting CHIs in the digital transformation process.

Duration: 1 Hour – 05/11/2020, 11:00 EET

Abstract

This 1-hour session is aimed at Cultural Heritage Institutions looking at new opportunities offered by digital heritage collections and technological tools for getting closer to their existing network and engage with new audiences in innovative and engaging ways.

Following the pace of the digital transformation is a must that all CHIs are currently experiencing, requiring big efforts in digitization, online presence and social media actions, all with the objective to increase visibility and to become more deeply rooted in the heritage community. This is enabled and backed up with services and systems for digital collections management, aggregation to online repositories, and tools for metadata enrichment and annotation. While the services can be outsourced, the process as such requires careful planning and execution, on the basis of specialistic knowledge and multidisciplinary expertise that are ideally built inside the institutions.

During the covid 19-crisis, when they were forced to close their premises, museums and libraries became fully aware of the importance of leveraging their digital cultural collections as a form of compensation for the unavailability of the physical spaces. As the digital environment very much is a global one, CHIs are now engaging with users from all over the world, thus meeting new audiences with no geographic boundaries. Yet this expansion, both in terms of audience and digital features adding to the physical experience, remains complementary to the place and role of memory institutions as representatives of their local community and its history.

In the post-covid scenario, therefore, it will be more important than ever to reconnect with local communities, by compelling user engagement actions via user-driven storytelling, co-creation, crowdsourcing and citizen participation. In this multidisciplinary webinar, success stories and best

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practices from international projects will be presented as case studies, offering different perspectives on what is possible to achieve by leveraging digital collections, technology and tools.

What you'll gain

- ☐ Knowledge-transfer from success stories and challenges of engaging users with cultural content
- ☐ Increased capacity in co-creation and storytelling strategies
- ☐ Reflections about crowdsourcing and citizen participation as means to get closer to local communities and to foster participatory approaches in (local) cultural heritage
- ☐ Discovery of tools and opportunities that leverage digital cultural heritage collections and enable international collaborations, including an overview on the metadata curation, enrichment, aggregation and annotation processes

Case studies

Fifties in Europe Kaleidoscope, user engagement with photographic heritage

WeAre#EuropeForCulture, co-creation events and citizen participation: stories from Nicosia

Europeana: a community empowering the cultural heritage sector in its digital transformation

PAGODE – Europeana China and Europeana XX: Century of Change: diversity, multiculturalism, identity and storytelling

Agenda

Introduction: scope of this workshop

Dr. Antonella Fresa, Promoter / Photoconsortium

Antonella is working on European projects since the nineties, and since 2002 she is technical coordinator and communication manager of national and European projects in the domains of digital cultural heritage, creativity and co-creation, citizen science, smart cities, digital preservation and e-infrastructures.

Fifties in Europe Kaleidoscope: an innovative MOOC for education and user engagement with photographic heritage

Prof. Fred Truyen, KU Leuven / Photoconsortium

Fred is professor at the Faculty of Arts, KU Leuven where he is in charge of the mediaLab CS Digital. He publishes on Digitization, Photography and E-Learning. He is involved in many projects on Open Educational Resources and on Europeana.

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WeAre#EuropeForCulture, co-creation events and citizen participation: stories from Nicosia

Prof. Marinos Ioannides, Cyprus University of Technology

Marinos is the director of the Digital Heritage lab of the Cyprus University of Technology in Limassol, coordinating various important projects in the area of research on digital cultural heritage, virtual museums, 3D reconstructions. He is also the chair of EUROMED 2020.

Europeana: a community empowering the cultural heritage sector in its digital transformation

Julia Fallon, Europeana Foundation

Julia is the chair of the rights statements consortium and manager of Europeana Community and Partner Engagement Team, together supporting the development of professionals and organizations working in and around digital cultural heritage, leading the development of our digital programme & a knowledge hub of events, webinars and resources all supporting the sector in their digital transformation journey.

PAGODE – Europeana China and Europeana XX: Century of Change: from metadata to storytelling and back

Sofie Taes, KU Leuven / Photoconsortium

Sofie works as a Digital Curator for the Institute for Cultural Studies (CS Digital) at KU Leuven and Photoconsortium, and has curated several virtual and physical exhibitions for Europeana-related projects (EuropeanaPhotography, Europeana Migration, Europeana Common Culture, Kaleidoscope).

Patrons of the event

Promoted by	In collaboration with	
		
		
Official Media Partner	Acknowledgements	
	 <p>Fifties in Europe Kaleidoscope, PAGODE - Europeana China, Europeana XX: Century of Change are projects co-financed by Connecting Europe Facility Programme.</p>	

Workshop4 - 1st International Workshop on Cultural Tourism: Discovery Europe.

This event will focus on:

Currently, due to COVID-19, the tourism industry is facing key economic and social challenges. The pandemic managed to bring global tourism to a standstill, thousands of persons are unemployed and millions of people in quarantine have been seeking out cultural and travel experiences from their homes. Culture has proven indispensable during this period, and the demand for virtual access to museums, heritage sites, theatres and performances has reached unprecedented levels. The Discovery Europe Workshop will give the opportunity to showcase local identity as a competitive advantage of the EU Member States, as far as sustainable tourism development is concerned, as well as boost networking among the participants, the exchange of best practices, knowledge and experience on this specific topic.

Despite all the challenges, the tourism and culture sectors are facing an opportunity to create new partnerships and collaboration. They are bound to jointly reinvent and diversify the offer, attract new audiences, develop new skills and support the world's transition to the new conditions.

Therefore, it is an opportunity to promote sustainable and hybrid tourism driven by new practices and innovations which promote lifelong learning. It is the time and the challenge to reinvent ourselves with a vision to build a better tomorrow.

The Discovery Europe workshop will focus on the following important aspects:

- Improve information and data exchange between individuals, experts, stakeholder and sectors,
- Improve networking among local, regional and international organizations and launch innovative alliances,
- Form a more resilient tourism and culture workforce,
- Strengthen policy and governance structures for better coordination, awareness and information sharing,
- Attract new audiences



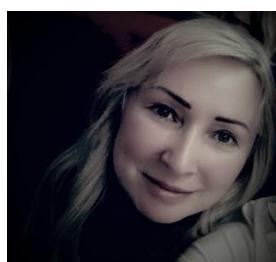
1st International Workshop on Cultural Tourism: Discovery Europe.



Eastern European Time (CY Time)	Wednesday 04/11/2020	
10:30-10:35	Opening Prof. Marinos Ioannides , <i>UNESCO Chair on Digital Cultural Heritage</i> , Carolina Islas (project manager), University of Turku, Finland	
	Name	Title of Presentation
	Session 1: The sustainability of cultural tourism during and after the pandemic. (Facilitators: Silvia De Ascaniis , Laura Puolamäki)	
10:35 -10:55	Milada Šťastná , Prof. Dr. Ing. and HoD, Mendel University in Brno, Czech Republic. Coordinator of the H2020 project SPOT	<i>Possible directions of rural tourism development in the light of Covid-19: Case study: South Moravia</i>
10:55 -11:15	Simona Tondelli , Prof. at the Alma Mater Studiorum - University of Bologna. Coordinator of the H2020 project RURITAGE	<i>Thinking beyond the COVID-19 crisis: heritage- based opportunities for tourism in rural areas</i>
11:15 -11:35	João Martins , Prof. Universidade Nova de Lisboa, Portugal. Coordinator of the H2020 project IMPACTOUR and participant at the upcoming H2020 project TExTOUR	<i>Improving Sustainable Development of Cultural Tourism – what if...</i>
11:35 -11:55	Ann Uustalu , Policy Officer with focus on Cultural Heritage and Cultural and Creative Industries, European Commission, DG for Research and Innovation, Rodrigo Martín Galán , Research Programme Officer at the European Research Executive Agency (REA) in charge of the portfolio on Cultural Heritage	<i>Horizon Europe Research policy - Cultural Tourism</i>
11:55 – 12:00	Promoting dialogue	
12:00 -12:15	Coffee Break	

	Session 2: Promote and support innovative alliances among regional and international cultural tourism organizations. (Facilitators: Miroslav Vujicic , Uglješa Stankov)	
12:15 -12:35	Stefano Dominioni , Executive Secretary of the Enlarged Partial Agreement on Cultural Routes of the Council of Europe (EPA) and Director of the European Institute of Cultural Routes (EICR)	<i>How Cultural Routes of the Council of Europe promote regional and international cooperation</i>
12:35 -12:55	Nadia Fontana Lupi , President of the World Heritage Experience Switzerland	<i>World Heritage Experience Switzerland and the ambition to become a competence center for the innovation process of UNESCO's WHL in Switzerland</i>
12:55 -13:15	Susanna Markkola , Manager, Cultural Tourism at Visit Finland , Business Finland	<i>Networking – the first step to the cultural tourism</i>
13:15 -13:35	Antonella Fresa , Director of implementations at Promoter SRL , Italy	<i>The challenge of the 'incultum' for a new approach to cultural tourism</i>
13:35 - 13:40	Promoting dialogue	
13:40 -14:25	Lunch	
	Session 3: Resilient cultural tourism at heritage destinations. (Facilitators: Silvia Aulet , Dejan Paliska)	
14:25 -14:45	Peter DeBrine , UNESCO - Programme Specialist Sustainable Tourism ,	<i>Heritage, Tourism and Covid-19: Recovery, Resiliency and Rejuvenation</i>
14:45 - 15:05	Piet Jaspaert , EUROPA NOSTRA, Vice - President ,	<i>Cultural Heritage...a path to the future</i>
15:05 -15:25	Celia Martínez Yáñez , Tenured Professor in the Art History Department of the University of Granada. Vice-president of the ICOMOS International Scientific Committee on Cultural Tourism (ICTC)	<i>Cultural Heritage preservation and sustainable tourism development: the ICOMOS ICTC vision and role to confront present and future challenges</i>
15:25 - 15:45	Theano S. Terkenli , Prof. University of the Aegean , Greece	<i>The landscape as key to resilient cultural tourism stewardship</i>
15:45 – 15:50	Promoting dialogue	
15:50 -16:10	Coffee Break	
	Session 4: The impact of digital cultural tourism on a local and regional level. (Facilitators: Tony Cassar , Laura Puolamäki)	
16:10 -16:30	Prof. Claire Wallace - Stephanie Garrison , University of Aberdeen, UK,	<i>Online Cultural Activity and Fan Tourism in Scotland</i>

16:30 -16:50	Iulia Niculica, Partnerships Manager, European Travel Commission (ETC)	<i>Partnerships for Promoting Europe to global passion communities</i>
16:50 -17:10	Lorenzo Cantoni, Prof. Università della Svizzera Italiana, UNESCO Chair in ICT to develop and promote sustainable tourism in the World Heritage Sites,	<i>How to Harmonize Digital media, (Intangible) Heritage and Sustainable Tourism</i>
17:10 -17:30	Keynote Speech/Discussion/Final Conclusions Chair: Prof. Antonis Theocharous – Cyprus University of Technology, Tony Cassar – Heritage Malta	
17:30	End of Workshop	



Mendel
University
in Brno



Milada Šťastná, Prof. Dr. Ing. and HoD, Mendel University in Brno, Czech Republic. Coordinator of the H2020 project SPOT

Prof. Dr Ing. Milada Šťastná is the Head of Department of Applied and Landscape Ecology at Mendel University in Brno, Czech Republic and the Editor in Chief of the European Countryside journal. Her professional interests focus on cultural tourism; landscape ecology; environmental protection and sustainability, related to the climate change impacts. She has a PhD in Applied and Landscape Ecology and during her 22 years' professional career published as an author and co-author 71 scientific papers, participated in 16 monographs and presented 125 other publications and papers at international conferences, symposia and seminars. Since 2020 she is the coordinator of SPOT - H2020 project: Social and innovative Platform On cultural Tourism and its potential towards deepening Europeanisation. The project aims to develop a new approach to understanding and addressing cultural tourism and to promote the development of disadvantaged areas on the one hand and propose recommendations to areas with tourism overpressure on the other. The project uses case studies across 15 European regions, consolidates definitions of 'cultural tourism', engages academics and stakeholders in developing policy proposals in practice and posits means of generalising the lessons via an Innovation Tool to assist policy-makers at all levels as well as practitioners.

PRESENTATION TITLE: Possible directions of rural tourism development in the light of Covid-19: Case study: South Moravia

ABSTRACT:

Tourism is the sector which caused the epidemic to spread rapidly throughout the world and, at the same time, the sector which suffered the greatest financial losses. However, detailed results show that the losses affected mainly providers linked to international tourism. Examples from South Moravia show that domestic tourism experienced an unusual increase during the summer season of 2020. In many cases, visits by domestic tourists exceeded reality in 2019. There was also no decline in employment noticed. The second wave of the epidemic brought a decline again, which fortunately occurred after the main season. The question is to what extent the shift of tourists' interest to domestic tourism will last after the end of the unfavourable hygienic situation. To keep or support this trend require the

strengthening of the infrastructure in rural areas, its organizational and information services and the cooperation of providers in the sector. In the optimal case, such enhanced cultural tourism in the countryside could attract foreign visitors to a greater extent after the situation gets normalized.



Simona Tondelli, Prof. at the Alma Mater Studiorum - University of Bologna. Coordinator of the H2020 project RURITAGE

Simona Tondelli is full professor of urban and regional planning at the University of Bologna. She has 22 years of research experience in sustainable urban planning and regeneration. She is head of the Refurbishment and Restoration division of the UNIBO Interdepartmental Centre for Applied Research on Buildings and Construction. Currently, she is project coordinator of RURITAGE H2020 project, of MATCH-UP INTERREG EUROPE project, ADRISEISMI ADRION INTERREG project, and partner in many EU/regional/local Research Projects. Vice-Director of the Emilia-Romagna section of the Italian National Urban Planning Institute – INU and Treasurer of the National Urban Planning Institute, she is member of all the main Italian Urban Planning associations (INU, CENSU, SIU), and former President of the Association of the Engineers of the Bologna Province. She is member of scientific board of Architecture Doctorate of Bologna. Author of over 100 publications.

PRESENTATION TITLE: Thinking beyond the COVID-19 crisis: heritage-based opportunities for tourism in rural areas



João Martins, Prof. Universidade Nova de Lisboa, Portugal. Coordinator of the H2020 project IMPACTOUR and participant at the upcoming H2020 project TExTOUR

João F. A. Martins is now with the Faculty of Sciences and Technology, Universidade NOVA de Lisboa, Portugal, where is an Associate Professor with Habilitation, being currently the head of the Electrotechnical Engineering and Computers Department. He has collaborated in several national and international projects (as collaborator or coordinator) and is currently with the Center of Technology and Systems (CTS), UNINOVA, Lisbon, Portugal, where he coordinates the energy efficiency group and acts as Communication Officer at the Board of Directors. Additionally, he is a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE), he is an Effective Member of the Portuguese Engineers Association and Founding Member of the Portuguese Society for Engineering Education. His research interests are mainly in Heritage Buildings and Cultural Heritage, along with energy efficiency (alternative energies and power quality, intelligent and energy efficient buildings, user awareness, renewables integration).

PRESENTATION TITLE: Improving Sustainable Development of Cultural Tourism – what if...

ABSTRACT:

IMPACTOUR H2020 project, and many other initiatives, is concern with the assessment of the impact of Cultural Tourism on European economic and social development. Furthermore it aims to improve Europe's policies and practices on CT, strengthening its role as a sustainable driving force in the growth and economic development of European regions. Nevertheless IMPACTOUR, and many other, was caught in the middle of the COVID-19 pandemic crisis. Cultural Tourism sector is starting to respond to the current situation in order to mitigate its negative impact. WHAT IF we face a different type of crisis? Are we prepared?



Ann Uustalu, Policy Officer with focus on Cultural Heritage and Cultural and Creative Industries, European Commission, DG for Research and Innovation

MSc from SLU Uppsala 1986. Professional experience in the Ministry for Foreign Affairs Sweden, the UN and the European Commission with main focus on food security, development and foreign policy, postings in Harare, Riga and Rome. Currently research policy officer with focus on Cultural Heritage and Cultural and Creative Industries, European Commission Directorate General for Research and Innovation.



Rodrigo Martín Galán, Research Programme Officer at the European Research Executive Agency (REA) in charge of the portfolio on Cultural Heritage

Studied Archaeology at the Universidad Autonoma de Madrid. Made his PhD on Near Eastern Archaeology and was working in archaeological excavations and cultural heritage projects in Syria since 1992 till 2010. Then participated in projects in Spain and worked at the office for cultural Heritage at the University of Alcalá de Henares (world heritage site). Also worked as an expert on Cultural Heritage for different organizations (EU, UNESCO). Currently: Research Programme Officer at the European Research Executive Agency in charge of the portfolio on C.H.

PRESENTATION TITLE: Horizon Europe Research policy - Cultural Tourism

ABSTRACT:

Horizon Europe Research policy - Cultural tourism This presentation will address EU research policy with a focus on cultural tourism. It will provide some insights into research and innovation (R&I) within the wider context of Cultural heritage and Cultural and Creative sectors which has been funded under the current R&I programme H2020. It will also highlight some trends and challenges in this area of research presenting the input provided by on-going projects IMPACTOUR - SmartCulTour - SPOT in a workshop organised by DG R&I and REA (June 2020). The strategic orientations of the next framework R&I programme Horizon Europe (still in process of finalization) and its structure will be presented. The main policy trends of relevance to cultural tourism will be outlined, along with the links to the wider EU political agenda.



Cultural route
of the Council of Europe
Itinéraire culturel
du Conseil de l'Europe



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Stefano Dominioni, Executive Secretary of the Enlarged Partial Agreement on Cultural Routes of the Council of Europe (EPA) and Director of the European Institute of Cultural Routes (EICR)

Stefano DOMINIONI, Executive Secretary, Enlarged Partial Agreement on Cultural Routes - Council of Europe (EPA) Director, European Institute of Cultural Routes (EICR) Stefano Dominioni is Executive Secretary of the Council of Europe Enlarged Partial Agreement on Cultural Routes (EPA) and Director of the European Institute of Cultural Routes (Luxembourg). He is responsible for overseeing the certification by the Council of Europe of Cultural Routes in the field of European culture and heritage across its 47 Member States and the regular evaluation of the current 38 certified cultural routes. Dr. Dominioni ensures EPA Governing Board and Statutory Committee operations, management of the European Institute of Cultural Routes and coordination with the Cultural Routes of the Council of Europe. He is responsible for the implementation of Joint Programmes with the European Commission, and cooperation with other International Organisation such as UNESCO, UNWTO, OECD and OEI. During his career at the Council of Europe, he has worked for the Directorate General of Education, Culture and Youth and the Directorate General of Social Cohesion. He received his Ph.D., M.Phil. and M.A. from Yale University, a M.A. from the Université d'Aix-Marseille and a B.A. from the University of Milan. He was Research Fellow at Cambridge University (England).

PRESENTATION TITLE: How Cultural Routes of the Council of Europe promote regional and international cooperation

ABSTRACT:

How Culture Routes of the Council of Europe promote regional and international cooperation The "Cultural Routes of the Council of Europe" Programme was launched by the Council of Europe in 1987 and features 38 certified routes across its 47 member States and beyond, inviting to travel and to discover the rich and diverse heritage of Europe by bringing people and places together in networks of shared history and heritage. They put into practice the values of the Council of Europe: human rights, cultural diversity, intercultural dialogue and mutual exchanges across borders. Each Cultural Route is managed by an international network, including members from various fields such as national and local authorities, cultural heritage sites, universities, as well as companies from the leisure and tourism sector. The networks implement innovative activities in the fields of art, architecture, history, literature, music, and landscape pertaining to five main priority fields of action: co-operation in research and development; enhancement of memory, history and European heritage; cultural and educational exchanges for young Europeans; contemporary cultural and artistic practice; cultural tourism and sustainable cultural development. Through its programme, managed from Luxembourg by the Enlarged Partial Agreement on Cultural Routes (EPA) with the support of the European Institute of Cultural Routes, the Council of Europe offers a model for transnational cultural and tourism management and allows synergies between national, regional and local authorities and a wide range of associations and socio-economic actors. For more information: www.coe.int/routes.



**WORLD HERITAGE
EXPERIENCE**  Switzerland

**Nadia Fontana Lupi, President of the World
Heritage Experience Switzerland**

Nadia Fontana Lupi has worked for about 20 years in the sales and marketing departments of the Swiss airline industry (Swissair, Crossair and Swiss) and since 2004 she has been the director of the regional tourism organisation responsible for the development of tourism and hospitality in the southernmost region of Switzerland, Mendrisiotto. From 2008 to 2014 she was a member of the Board of Directors of the Tourism Marketing Organisation of Ticino Tourism. Nadia participated in the creation of the Monte San Giorgio Foundation (UNESCO WHL since 2003), of which she was vice-president until 2012. She was also responsible for the candidacy dossier for the Holy Week Processions in Mendrisio which, on 12 December 2019, the thirteenth Intergovernmental Committee for the Safeguarding of Intangible Cultural Heritage decided to include in the Representative List. Nadia is also a member of the board of directors of the national association "World Heritage Experience Switzerland" since 2009 and current president.

PRESENTATION TITLE: World Heritage Experience Switzerland and the ambition to become a competence center for the innovation process of UNESCO's WHL in Switzerland

ABSTRACT:

World Heritage Experience Switzerland (WHES) is the national association for the UNESCO World Heritage in Switzerland. Founded in 2009, WHES works in partnership with national and international organisations, universities, federal institutions and the Swiss UNESCO Commission. The network helps to ensure sustainable development of the universal values, to create added value for the properties and its partners, and to coordinate the work in the World Heritage Sites framework within Switzerland. In the first 10 years, WHES has established solid partnerships with major national DMOs, Tour Operators, Medias, as well as a unified communication and offer for the World Heritage properties. With the support of the Cantons and the State Secretariat for Economic Affairs two projects have been successfully implemented for the creation of sustainable tourism products, establishment and development of a central bureau while a 3th project has started in the field of digitalisation. WHES is also active in the European context, working closely with parallel entities in the field, in order to promote exchange of expertise and best practices. As of 2020, WHES is focusing on developing the association as a competence centre, expanding the activities in sustainable tourism, mediation and management fields, while fostering the collaboration within the network and developing new tools.



**Susanna Markkola, Manager, Cultural Tourism
at Visit Finland, Business Finland**

Susanna Markkola works as a Manager of Cultural Tourism at Visit Finland, which is part of Business Finland. Susanna is responsible in culture themed development work on national level. Her work consists of networking of cultural and tourism actors and enhancing product development in cultural tourism. Susanna has a long experience in tourism business and culture as a developer as well as an entrepreneur. With cultural tourism she has been working since 2013.

PRESENTATION TITLE: Networking – the first step to the cultural tourism



**Antonella Fresa, Director of implementations at
Promoter SRL, Italy**

Antonella Fresa is director of implementations at Promoter SRL, an SME located in the area of Pisa. In this role, she is technical coordinator and communication manager of national and European projects on digital cultural heritage and digital transformations in the cultural heritage field. She is project manager of digitalmeetsculture.net, the online magazine published by Promoter with more than 20,000 visitors per month. Her interests lay in particular on virtual museums, digital cultural archives, participatory approaches and citizen science, cultural heritage led urban regeneration and smart cities, digital preservation and e-infrastructures. She regularly serves as independent expert of the European Commission and of national and regional research bodies. Furthermore, she is Vice-President of Photoconsortium International Association for valuing photographic heritage, Enterprise Fellow at Coventry University and founding member of IDEA International Digital Epigraphy Association.

PRESENTATION TITLE: The challenge of the 'incultum' for a new approach to cultural tourism

ABSTRACT:

Tourism is more than travelling and consumption; it has great potential when it comes to culture, nature, knowledge and personal experiences. Travelling is a way to learn and improve oneself, to enrich one's vision and improve mutual understanding. The speech will discuss challenges and opportunities of cultural tourism when it aims to furthering sustainable social, cultural and economic development. It will present some cases when the potential of marginal and peripheral areas can be unlocked when managed by local communities and stakeholders. Innovative participatory approaches can be instruments to transform locals into protagonists, reducing negative impacts, learning from and improving good practices to be replicated and translated into strategies and policies. Intercultural understanding and implementation of bottom-up strategies can have positive effects for both, locals and tourists. Pilot experiences, in real-life environments around Europe, would be important to derive lesson learnt and to identify threats, to suggest recommendations for effective and sustainable policies, to propose new forms of synergies among public and private stakeholders and to foster new investments, including the use of structural funds and smart specialisation strategies at regional level.



Peter DeBrine, UNESCO - Programme Specialist Sustainable Tourism

Mr. DeBrine joined UNESCO in 2011 to coordinate the World Heritage and Sustainable Tourism Programme, providing a global framework for finding coordinated sustainable tourism solutions for heritage conservation and local community development. As a Senior Project Officer he spearheads the implementation of the overall programme activities including project management, outreach and resource mobilization. Previously he was the Director of the World Heritage Alliance at the United Nations Foundation—a global community of travelers, members of the travel industry, government groups, non-governmental organizations, and the United Nations working together to preserve and protect World Heritage sites while supporting local communities. With extensive experience in sustainable development and tourism, Mr. DeBrine held the position of Deputy Director of the International Tourism Partnership for the Prince of Wales International Business Leaders Forum where he worked with major hotel companies to create practical sustainability strategies and tools for the tourism industry. Formerly, Mr. DeBrine worked as a Forestry Officer for the UN Food and Agriculture Organization where he helped shape an international partnership for sustainable development in mountain regions. This builds on his many years as an environmental campaigner for WWF working on climate change, endangered species and sustainable tourism issues in the US and Europe. Mr. DeBrine holds an MBA from the Thunderbird School of Global Management and a bachelor's degree in Chemistry from the University of Colorado, Boulder.

PRESENTATION TITLE: Heritage, Tourism and Covid-19: Recovery, Resiliency and Rejuvenation



Piet Jaspaert, EUROPA NOSTRA, Vice - President

Piet Jaspaert (Belgium) obtained a PHD in Political and Social Sciences (Ghent, 1972) and got an Eisenhower Exchange Fellowship in 1990. He has been teaching languages, opening and running the Cultural Center in Hasselt, managing the Communication and Marketing of KBC Bank and Insurance. For ten years he has been President of the Jury for ethical practices in Advertising. He held many volunteer positions. The Flemish Government has called upon him to take on national tasks, such as the Presidency of the Youth Council, the Advisory Board for Theater and the Government's Agency Tourism Vlaanderen. Thirty years ago, he was one of the three founders of Open Monuments Day in Flanders. He is still involved in many social and cultural organisations as Klarafestival, Concertgebouw Brugge, Kom op tegen Kanker. He has been Board Member of Europa Nostra for 9 years and was appointed Vice-President in 2015. He is particularly involved in EU heritage policy affairs, European Heritage Awards/Europa Nostra Awards and the 7 Most Endangered programme.

PRESENTATION TITLE: Cultural Heritage...a path to the future



**Celia Martínez Yáñez, Tenured Professor in the
Art History Department of the University of
Granada. Vice-president of the ICOMOS
International Scientific Committee on Cultural
Tourism (ICTC)**

Celia Martínez Yáñez is Tenured Professor in the Art History Department of the University of Granada and at the Master of Architecture and Historic Heritage (ETSA of Seville, Andalusian Institute of Historical Heritage, Council of the Alhambra and the Generalife). She is also Vice-president of the ICOMOS International Scientific Committee on Cultural Tourism (ICTC) – in charge for the coordination of the ICOMOS International Cultural Tourism Charter revision-, and Assistant Secretary of ICOMOS Spain. Author of about a hundred scientific papers, books, book chapters and conferences on these subjects and Editor-in-Chief of *erph*, online scientific journal on historic heritage.

PRESENTATION TITLE: Cultural Heritage preservation and sustainable tourism development: the ICOMOS ICTC vision and role to confront present and future challenges

ABSTRACT:

This talk is aimed at providing an overview of the role of the ICOMOS International Scientific Committee on Cultural Tourism (ICTC) concerning the inextricable, complex and multidimensional relationships between cultural heritage preservation and sustainable tourism development. Our goal is to present the ICTC as a relevant international actor able to approximate the different sectors and communities that intervene in these relationships, whose dialogue and coordination is more needed today than ever to making future heritage tourism more balanced, sustainable and participative. To do so, this talk will: 1) Outline the main contributions that the ICTC has made to this subject since its creation in the 70's, among which the two ICOMOS International Cultural Tourism Charters (1976, 1999). 2) Expose the ICTC current partnerships concerning cultural heritage protection and sustainable tourism enhancement, particularly stressing those with UNESCO and in the framework of the ICOMOS advisory role of the Convention Concerning the Protection of the World Cultural and Natural Heritage (1972). 3) Delve on the deep impacts that covid-19 is having on the tourism activity and on heritage conservation practice worldwide, and on the strategies and synergies that the ICTC is currently implementing to confront major challenges. Among these strategies, we will particularly focus on two fields of activity: _ The revision of the ICOMOS International Cultural Tourism Charter (1999) that the speaker is coordinating within the ICTC, in view to producing an international recommendation updated and adapted to current situation, and to the diversity of new policies and tools that need to be implemented to ensure cultural tourism destinations and cultural heritage resiliency in the next decades. In this regard, we would like to take advantage of the networks built by this workshop to gain the participating organizations' collaboration and input in the drafting of this document, including their input from a European tourist and cultural perspective. The ICTC involvement and ICOMOS' leadership in addressing today's social, economic, cultural, and environmental challenges that, together with the covid-19 itself, are increasingly framing and re-orienting cultural heritage preservation and enhancement and the tourism activity: sustainable development strategies and the SDGs; climate change adaptation and mitigation solutions; safeguarding cultural diversity; and the rights of past, current and future generations, Indigenous Peoples and local communities to take part of these global policies that will shape our lives and planet in the next future.



**Theano S. Terkenli, Prof. University of the
Aegean, Greece**

Professor and founding member of the first Department of Geography in Greece, University of the Aegean (1994-today). Faculty and representative of the Department of Geography at the Interdepartmental Graduate Program in Tourism Planning, Administration and Policy of the University of the Aegean (1999-today). Ph.D. in Geography, University of Minnesota—Twin Cities, USA (1986-1993), M. Sc. in Landscape Architecture, University of Wisconsin—Madison, USA (1983-1986) and B.Sc. in Forestry & Environmental Science Aristotelian University of Thessaloniki, Greece (1978-1983). Research, publishing and teaching specialty and interests in Cultural Geography, Landscape Geography and Critical Perspectives to Tourism. Active member, conference organizer, and/or board member of several international and Greek associations and organizations. Roy Wolfe Award 2017, for outstanding contributions to the field and discipline of recreation, tourism and sports geography, from the American Association of Geographers—Recreation, Tourism and Sport Specialty Group. Books, indicatively: 1) Connections, Mobilities, Urban Prospects and Environmental Threats: the Mediterranean in Transition, editor with Annick Douguedroit and Louis F. Cassar, (Cambridge Scholars Publishing, 2015); 2) Human Geography: Humans, Society and Space, editor with T. Iosifidis and I. Chorianopoulos (Athens: Kritiki, 2007); 3) Landscapes of a New Cultural Economy of Space, editor with Anne - Marie d'Hauteserre, Landscape Series (Dordrecht: Springer, 2006; 4) Tourism Geography, with N. Metaxidis and P. Raftopoulou, (Athens: Educational Books Publishing Organization, 2003).

PRESENTATION TITLE: The landscape as key to resilient cultural tourism stewardship

ABSTRACT:

Landscape, as a concept and as a human construct, synthesizes all aspects and parameters of our surrounding space, both natural/physical and cultural/symbolic, tangible and intangible. Thus it represents a most useful terrain/ grounds for various types of planning and a comprehensive medium for natural and cultural resource protection, management, promotion, consumption and, generally speaking, every human intervention. By bringing together humans and their cultural imprint on the land, landscape becomes an indispensable and readily amenable and accessible receptacle for cultural tourism: as a tourist attraction in itself; as the stage and backdrop for the development of tourism; as a container and source of tourism resources and attractions; as a means for promoting tourism; as a tool for studying tourism; and as a medium for developing an understanding and appreciation of a destination. Furthermore, as landscape represents a common good and collective right and responsibility, it may draw and mobilize local societies towards mutually beneficial goals, including the development of various types of cultural tourism. Such goals are obviously best undertaken on the basis of the principles of locality, sustainability, multifunctionality, identity and participatory governance—crucial to the new world of post-COVID-19 challenges and prospects. These principles stem from and refer to the nature of the landscape itself; they create or enrich cultural tourism possibilities and safeguard the destination and its resources, so that both tourism is sustained and the landscape continues to supply all those cultural tourism attractions ad infinitum (i.e. walking paths, local products, gastronomy and wine, traditional feasts and festivals, etc.). Landscape may thus be key not only to resilient, locally-beneficial and democratically stewarded cultural tourism, but ensure the continuity of all other landscape functions (i.e. production, transportation and communication, social services etc.), since all of the latter are, or may be, highly interconnected with the landscape and with cultural tourism itself.



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**Prof. Claire Wallace, University of
Aberdeen, UK**

Claire Wallace is Professor of Sociology at the University of Aberdeen and Principal Investigator for the H2020 project SPOT: Cultural Tourism. The work of the Aberdeen Team is to look at the impact of media tourism in Scotland, a unique and under-researched field. She is also regional partner on a British Research Council Funded project DIGIT: Digital Working Research Centre. Claire Wallace has been researching how cultural heritage can transform rural areas and improve quality of life since ten years. She was previously President of the European Sociological Association and has led or partnered in many European projects.



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Stephanie Garrison, University of Aberdeen, UK

Stephanie Garrison is a Research Fellow on the H2020 project SPOT: Cultural Tourism. The work of the Aberdeen Team is to look at the impact of media tourism in Scotland, a unique and under-researched field. Her research interests include media fandom, fan networks and media tourism.

PRESENTATION TITLE: Online Cultural Activity and Fan Tourism in Scotland

ABSTRACT:

While the Covid-19 crisis has highlighted the ingenuity of digital tourism and hybridization of tourism, social media has been a significant proponent of fan visitor engagement in cultural activities well before the pandemic. This is evident with fan experiences of Scottish culture both on and offline. This paper draws on a case study of fans of the novel and television series Outlander to illustrate how fans of these media texts draw on social media, whether through Facebook fan networks, Twitter accounts, dedicated travel blogs or through other social media platforms, to link up with local Outlander related sites in Scotland. We use the specific example of Doune Castle in Scotland, a widely popular 14th century castle featured in the production of Outlander, to advocate future areas of investigation. These include investigating the link between emergent forms of cultural tourism, such as media tourism, and the place of social media in supporting (or, to a certain extent, engendering) these new forms of tourism.



EUROPEAN
TRAVEL
COMMISSION

**Iulia Niculica, Partnerships Manager, European
Travel Commission (ETC)**

Ms Niculica has been working for ETC for 7 years, contributing to the promotion of Europe as a tourist destination in long-haul markets. She has experience with advocacy and marketing projects, EU funding, managing relationships with National Tourism Organisations, as well as facilitating partnerships and affiliations with external organisations. She is also holding the Secretariat of the European Tourism Manifesto, an alliance bringing together more than 60 public and private organisations from the Travel & Tourism sector.

PRESENTATION TITLE: Partnerships for Promoting Europe to global passion communities

ABSTRACT:

The presentation will give an overview of ETC's marketing strategy, Horizon 2022. Designed together with ETC members, it aims to build a distinctive image of Europe as a tourist destination in long-haul markets, secure regional dispersion and create sustainable growth. This strategy implies a transition towards a new global thematic promotional approach, creating leverage for partnerships and digital focus. An example of a consumer pan-European promotional campaign launched in partnership with several European destinations will be included in this presentation.



Università
della
Svizzera
italiana

**Lorenzo Cantoni, Prof. Università della
Svizzera italiana, UNESCO Chair in ICT to
develop and promote sustainable tourism in
the World Heritage Sites**

Lorenzo Cantoni graduated in Philosophy and holds a PhD in Education and Linguistics. He is full professor at USI – Università della Svizzera italiana (Lugano, Switzerland), Faculty of Communication, Culture and Society, where he is director of the Institute of Digital Technologies for Communication. His research interests are where communication, education and new media overlap, ranging from computer mediated communication to usability, from eLearning to eTourism and digital Fashion, from ICT4D to eGovernment. He is chair-holder of the UNESCO chair in ICT to develop and promote sustainable tourism in World Heritage Sites, established at USI in 2013. He is USI's Pro-rector for Education and Students' experience, director of the Master in Digital Fashion Communication, done in collaboration with the Université Paris 1 Panthéon-Sorbonne, and vice-director of the Master in International Tourism. L. Cantoni has been Dean of the Faculty (2010-2014) and President of IFITT - International Federation for IT in Travel and Tourism (2014-January 2018).

PRESENTATION TITLE: How to Harmonize Digital media, (Intangible) Heritage and Sustainable Tourism


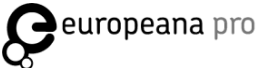
ABSTRACT:

The World Tourism Day 2020 has been devoted to “Tourism and Rural Development”. To promote such development, both tangible as well as intangible cultural heritage (ICH) are particularly important, supporting the preservation and communication of build heritage, together with traditional practices, festivities, craftsmanship. In the presentation, two cases from outside Europe will be presented: the case of Indonesian Batik with the #iWareBatik project and the case of “Machu Picchu seen through the eyes of Fernando Astete”. They will help to outline the complex relationships between heritage digitization and communication, as well as the complexity of ICH-related projects.

Workshop5 - Digital Heritage Crowdsourcing: Present and Future.

This event will focus on:

Drawing on the results of a recent study in the Europeana Common Culture project, the workshop will present the state of the art in digital cultural heritage crowdsourcing of different kinds across Europe. It will discuss what this can mean for data quality and community engagement and what the prospects are for co-ordinated access and preservation.

 <p><u>Digital Heritage Crowdsourcing: Present and Future</u></p> 		
Eastern European Time (CY Time)	Thursday 05/11/2020	
	Name	Title of Presentation
12:15-12:35	Rob Davies, Digital Heritage Research Lab, Cyprus	<i>Digital Cultural Heritage Crowdsourcing in Europe</i>
12:35-12:55	Milena Popova, Business Developer Manager, Europeana, Netherlands	Europeana's Crowdsourcing
12:55-13:15	Fiona Romeo, GLAM – WIKI project	<i>TBC</i>
13:15-13:40	Discussion/Final Conclusions Chair: Robert Davies	
13:40	End of Workshop	



Rob Davies, Digital Heritage Research Lab, Cyprus

Rob Davies is a staff member of the Digital Heritage Research Laboratory at Cyprus University of Technology. He is an experienced researcher, creator, leader and manager of European projects and networks in the fields of digital cultural heritage, public sector information and e-learning with an unbroken track record of over 20 years. He is a member of the Management Board of the Europeana Network Association and has worldwide experience in consultancy and project development for clients including the World Bank, the Asian Development Bank, the European Development Fund, The Bill and Melinda Gates Foundation, DFID and USAID.

PRESENTATION TITLE: Digital Cultural Heritage Crowdsourcing in Europe

ABSTRACT:

An overview of the state of the art and variety of DCH crowdsourcing in Europe. Prospects for future developments. Drawing on a study in the Europeana Common Culture 'ecosystem' project.



**Milena Popova, Programme and Business
Developer Manager, Europeana, Netherlands**

Milena Popova is responsible for the coordination of the Europeana Core Service programme and other EU-funded projects with Europeana Foundation (EF) participation, including Generic Services and Horizon 2020 projects. Her team also aims to explore and ensure new funding streams for EF in line with its strategy and business plans through the development of new partnerships and project proposals. Prior to this position, she worked as Head of the Re-use services team at Europeana to increase re-use of digital cultural content in education, research and by the creative industries.

PRESENTATION TITLE: Europeana's Crowdsourcing

ABSTRACT:

Milena will share experiences and lessons learned related to crowdsourcing in the context of Europeana's DSI and Generic Services projects. She will also introduce recent campaign-based activities and outline some new approaches, tools and services under development.



**Fiona Romeo, Senior Manager, GLAM and
Culture (Contractor), Community Programs**

Fiona has been working in the cultural sector for almost 15 years and is now Senior Manager for GLAM & Culture at the Wikimedia Foundation. Previously, Fiona led teams to deliver both digital and exhibition programmes within museums. She recently produced the Being Human gallery at Wellcome Collection, which was lauded for its inclusive design ([“Is This The World’s Most Accessible Museum?”](#)). Before that, Fiona was Director of Digital Content and Strategy at The Museum of Modern Art (New York) and Head of Design and Digital Media at Royal Museums Greenwich (London). At Royal Museums Greenwich, she developed new platforms for participation, including [citizen science projects, such as Old Weather](#), and the annual [Astronomy Photographer of the Year competition](#). At MoMA, Fiona [dedicated collection data to the public domain](#), released a comprehensive exhibition history, and deepened [MoMA’s engagement with Wikimedia](#) through editathons and linked data.

PAPER SESSIONS

Wednesday 04th November 2020

TIME	SESSION
18:00 - 20:00	<p>EuroMed 2020 – SHORT PAPERS</p> <p>DATA Acquisition and Processing</p> <p><i>Digital Data Acquisition Technologies in CH/2D and 3D Data Capture Methodologies and Data Processing</i></p> <p><i>2D and 3D GIS in Cultural Heritage</i></p> <p><i>Remote Sensing for Archaeology and Cultural Heritage Management & Monitoring</i></p> <p><i>On-Site and remotely sensed data collection</i></p> <p>Modelling and Knowledge management</p> <p><i>Interactive Environments and Applications</i></p> <p><i>Reproduction Techniques and Rapid Prototyping in CH</i></p>

DATA Acquisition and Processing

Digital Data Acquisition Technologies in CH/2D and 3D Data Capture Methodologies and Data Processing.

▪ **Application of Digital Fabrication Technologies in Reproducing Wooden Component in Heritage Buildings. (Short Paper)**

Anna Norina et al.

Abstract:

This current study aims to demonstrate the application of innovative digital surveying and digital fabrication technologies to physically replicate elements of wooden heritage structures. During the practical phase a framework was created and attested including preliminary on-site surveying with pictures processed through Photogrammetry pipelines to document the current state of the prototype element with the 3D model. Then, the virtual model is integrated into an algorithmic modeling program to generate coded milling paths. The result is a ½ scale prototype, crafted by robotic arm technologies from wood stock.

▪ **Photogrammetry for cultural heritage: digital surface reconstruction of molluscan exoskeletons from Eastern Mediterranean (Short Paper)**

Nafsika C. Andriopoulou et al.

Abstract:

The study of molluscs offers useful information on aspects of cultural heritage. Throughout the world, humans use molluscs, among others, for the creation of tools, ornaments, adornments and musical instruments, since ancient times. The parameters of form, dimension, texture, colour and composition of the exoskeleton are essential for the study of molluscs in all their multiple facets (i.e. taxonomy, distribution, morphometry, quantification, preservation). The three-dimensional (3D) representation of the surface of malacological material may contribute towards a deeper understanding of its surface morphology and potential weathering, and leads to conclusions related to the pre- and post-depositional processes that may affect the archaeological evidence. In the present study, we propose the non-destructive imaging and 3D representation of the surface of molluscan exoskeletons using digital photogrammetry principles. The main obstacles for using image analysis techniques to reconstruct the digital surface model of small sized ecofacts, are the sensitivity of the image geometry originating from common cameras and the absence of a reliable coordinate system to provide a robust scale reference for the studied object. Towards this end, in this study, the digital reconstruction of a series of exoskeletons of “modern” molluscan specimens from Eastern Mediterranean is performed. A relative coordinate system is implemented to provide quantitative information, while camera calibration partially undertakes intrinsic geometric errors of the camera system. Complete and fragmented specimens are examined, while exoskeleton flakes are also considered. The main challenges in the course of the proposed methodology, is first to establish a quantifiable model that may offer measurable properties including distances, areas and volumes and second to geometrically correlate unknown flakes with complete ones in order to identify their species. In addition, morphology indices are proposed to establish a set of inventory attributes to further support species taxonomy, including volume to area ratios and fractal-space indices of flakes and their origin structures. The

proposed study delivers an approach to reveal unknown flake identities and propose novel classification indices to enrich (archaeo) malacological records. The aforementioned methodology may find future applications in the study of other biogenic mineralised materials with cultural significance. Furthermore, 3D data may be used as an interactive resource for enriching issues related to natural history in public outreach, especially schools and museums.

▪ **ESTIA Disaster Management Platform for Cultural Heritage Sites. (Short Paper)**

Adam Doulgerakis et al.

Abstract:

ESTIA is a research and innovation project that aspires to develop a comprehensive platform allowing the forecast, detection and management of incidents that are related with the risk of structural fires within cultural heritage settlements and sites. ESTIA aims to (a) enhance the management and preservation of the cultural heritage, (b) limit the risks of fire incidents within traditional settlements and cultural heritage sites, (c) provide competent authorities with tools for training, coordination and support for an efficient response to fire incidents, (d) effectively protect and guide inhabitants and visitors, (e) suppress structural damages in historic buildings, historic settlements and cultural heritage sites and assets, (f) support and promote cultural events and tourism in harmony with the particular requirements of cultural heritage preservation. By incorporating advanced procedures for the semi-automatic digitization of the cultural heritage built environment as well as an advanced system that predicts the development of complex fire phenomena, the platform is an effective tool that on one hand, assists competent authorities in assessing the fire related risks and on the other hand, offers training to first responders and civil protection officers.

▪ **Digital traceological and mechanoscopic methods in the study of the stone surface of historical objects. (Short Paper)**

Jaroslav Valach et al.

Abstract:

The paper deals with the use of photogrammetry based on the structure from motion method, for the creation of digital models of surfaces, necessary for the study of traces of stonemasons on the surface of stone elements of architectural monuments using traceology and mechanoscopy. The result of the project dedicated to these tool traces will be a knowledge system that will link information about traces with tools, materials and buildings. This knowledge tool will enable both new ways of asking questions about the development of Prague and better protection of cultural heritage by suggesting suitable restoration intervention technologies.

▪ **Finite Element Analysis of Ancient Thousand Pillar Temple in Southern India (Short Paper)**

Somashekhar Reddy et al.

Abstract:

Ancient structures are a path to understanding the cultural heritage and traditions that existed long ago. They will also become an important link in transferring the knowledge from the past to present and future generations. Southern

India has thousands of temples, out of which few are known for their uniqueness in construction and stability. In this research, a thousand pillar temple built during 12th century AD in Hanamakonda, Telangana State has been considered. It is a finest example of Kakatiya's architecture completely built with stone spreading across the planar dimensions of 34 m x 34 m and a height of 9.5 m. Its foundation is believed to be laid in sand of 6 m depth. A complete three dimensional finite element numerical model is developed considering all the complex geometries, different types of columns and mandapas to form the integrated temple model. Individual structural element stresses are calculated to understand the role of complex geometry and global stresses are computed to understand the load flow and stability of the structure under the gravity analysis.

▪ **Numerical Modeling and Modal Analysis of Puranapul an Ancient Arch Bridge (Short Paper)**

Abhinav Kolla et al.

Abstract:

Since more than 30 years digital 3D modelling methods have been used to support research and education about Masonry arch bridges are recognized as nation's value infrastructure and heritage, especially in a country like India. Many masonry arch bridges are still in service, which indicates the robustness of their design and construction proficiency. Closure of important bridges will effect transport and economy of the nation. Due to insufficient knowledge on masonry structures and its testing has left many bridges have been disbanded. Continuity of non-use of heritage structures can deteriorate much faster as the absence of maintenance. In this study, a very old heritage arch bridge 'Puranapul' bridge which, was inaugurated in the year 1578 over the river Musi in Hyderabad built on key stone concept is considered for investigation of its health through basic visual inspection and non-destructive testing (NDT). And the same bridge is numerically modelled by using commercially available software ANSYS in three dimensional for assessing the basic mode shapes of the structure. The outcomes of this analyses have been employed to calibrate a finite element model used to investigate the structural behaviour of the bridge.

▪ **Photogrammetric Survey for the Architectural Restoration of Ecclesiastical Cultural Heritage Monuments: The Case Study of the Church of the Holy Cross in Tochni (Short Paper)**

Kyriacos Themistokleous et al.

Abstract:

This paper investigates the methodology of the digital documentation of an ecclesiastical monument in Tochni, Cyprus. The study very briefly describes the architectural history of the monument, as well as the changes that resulted in its current ruined condition. A photogrammetric survey of the monument was conducted to obtain its architectural elements, and subsequently conduct a restoration proposal. The aim of the survey is to investigate the use of photogrammetry using UAVs to examine historical monuments, in order to have a better understanding of the structure and elements that are difficult to measure and study in detail through traditional documentation.

2D and 3D GIS in Cultural Heritage

▪ **Mapping Cultural Heritage: CLIO MAP, Montenegro (Short Paper)**

Olga Pelcer-Vujacical et al.

Abstract:

The paper highlights the need for the digitization of cultural heritage in order to propose the first national mobile geoinformatics application. There is an unusually varied cultural heritage in the country that strongly relies on an income from Tourism and urges the need to build a new, exportable, interactive tool. In that sense, this article demonstrates the process flow in the online cultural map creation and its further development and sustainability. Being the first on the market, loaded with data provided by experts from several fields also brings challenges, which this paper elaborates upon. Hence, a case-study of the ArcGIS Online services usage in the Montenegrin cultural landscape, provides a great overview of the issues in drafting a national register of cultural heritage: from technical obstacles, policies of selection upto the interpretation of the data and preservation.

▪ **Geographic data inventory in Historic Areas for assessing Climate Change impacts in the HYPERION project. (Short Paper)**

Fotios Barmpas et al.

Abstract:

Climate Change (CC) and geo-hazards impact on historic areas hosting Cultural Heritage (CH) sites and monuments, and they have recently gained the interest of the scientific community, due to related environmental, social and economic challenges. Within this frame, the Horizon 2020 funded HYPERION project aims to leverage existing tools and services (e.g., climate/extreme events models, and their impacts, decay models of building materials, Copernicus services, etc.), as well as novel technologies (terrestrial and satellite imaging for wide-area inspection, advanced machine learning, etc.) to deliver an integrated Decision Support System for improved resilience and sustainable reconstruction of historic areas to cope with climate change and extreme events. The HYPERION system will be tested in four pilot cases in Greece (Rhodes), Spain (Granada), Italy (Venice) and Norway (Tønsberg). For this purpose, a detailed and accurate data and services inventory is compiled related to CC and various geo-hazards, including high-resolution geometry, land-use, vegetation and hydrology data for each pilot case. The collected data are processed with the use of efficient GIS applications, such as free and open source QGIS. The resulting inventory will be used for producing high-resolution input data to be fed into a dynamic downscaling modelling system for quantifying average and extreme CC and geo-hazard stressors in CH sites down to the local scale.

Remote Sensing for Archaeology and Cultural Heritage Management & Monitoring

▪ **Geoinformation technologies for conservation of cultural heritage. (Short Paper)**

Stefan Stamenov et al.

Abstract:

Cultural heritage today is endangered by many factors, some natural and most of them anthropogenic. The natural factors include vegetation, growing trees, some disasters, as earthquakes, atmospheric processes, etc. Among the anthropogenic factors there is also related to vegetation – agriculture and the cultivated crops, and related to construction activities and mining. Due to these factors, cultural heritage needs careful preservation and conservation activities and measures. The monitoring is probably the best way to provide a constant or frequent observation of the status and condition of the cultural sites. The provided method for monitoring is based on combination of satellite imagery and aerial photos, GIS mapping and integration of all the data into a geodatabase. The case study in this paper is the first capital of Bulgaria, Pliska, one of the most important archaeological reserves in Bulgaria.

▪ **Land movements estimation in Amathus archaeological site in Limassol district with In- SAR DIn-SAR methodologies (Short Paper)**

Despina Makri et al.

Abstract:

Amathus archaeological site is one of the most important monuments (memorials), which remains for up to 2300 years. Last decades, archaeological sites, face anthropogenic and natural disturbances. One of those is the land movements that come from landslides or earthquakes. Improved remote-sensing techniques and new data more contemporary can assist in archaeology because it provides extensive area coverage and access in difficult-to-reach archaeological sites. In the present study, we investigate the use of Synthetic Aperture Radar Interferometry (InSAR) in land movement estimation near archaeological sites. We applied the D-InSAR (Differential Synthetic Aperture Radar Interferometry) methodology in Sentinel-1 data. These data are free and available from Copernicus Open Access Hub. The methodological framework was implemented in SNAP software (Sentinel Applications Platform), which is free and available from the European Space Agency. The analysis had three main steps: a) to prepare the data and check the suitability, b) the production of the interferogram, and c) the production of displacement map in meter units. The results have shown that in the area of interest, the hazard of land movement is low.

On-Site and remotely sensed data collection

▪ **A Survey on Current Heritage Structural Health Monitoring Practices Around the Globe. (Short Paper)**

Laxmi Manisha Gandham et al.

Abstract:

Heritage structures have a significant role in the nation's history. They may be acknowledged for several reasons – age, structural magnificence, religious reasons, historical events or persons they hosted, construction challenges they had in era they were built, and so on. Preserving heritage structures is a prestigious and challenging task. Furthermore, an accurate knowledge of the behaviour of a structure is becoming more important as new construction and conservation techniques are introduced. Historical Structures have been exposed to environmental conditions for a very long time leading to the different degrees of malfunctioning at an elemental or global level. In order to assess the health of the structure, this paper presents the review on various methodologies adopted by different countries around the world in assessing and monitoring of Heritage structures. Special focus on latest technologies like Artificial Intelligence and sensors are discussed to address these challenges. A number of meaningful features have been monitored through extracting from SHM data.

Modelling and Knowledge Management

Interactive Environments and Applications.

▪ **Interacting with Cultural Heritage through Shape Representation Techniques in 3D Modeling Environments (Short Paper)**

Begum Moralioglu et al.

Abstract:

Three-dimensional (3D) representation of cultural heritage in a digital environment is coming into prominence for documentation of geometric and semantic details and the interpretation of shape representation from academic studies to commercial practices. To interpret cultural and historical shapes, the use of the computational medium is expanding with developing technologies. Advanced 3D design and development applications appear every day with distinct functions. However, not every technology provides designers a convenient medium to create, explore, and think naturally. In that sense, digital design mediums and tools become important to enhance the interactivity level with cultural heritage for designers through different interfaces. Particularly, the utilities of design interfaces are essential for preserving reconstructing ruined cultural heritage in the digital design mediums. In this study, we investigate the designers' creative design process in the context of shape representation methods within the possibilities of two different 3D design interfaces as a computer and virtual reality (VR) interfaces. At first, we conducted a shape exploration exercise to generate the 3D model pieces of the Dark Church in Cappadocia. And then, we used the generated 3D model pieces in a shape representation exercise to observe the seeing, imagining, and acting abilities of designers in computer and VR environments.

■ **Artwork Identification in a Museum Environment: A Quantitative Evaluation of Factors Affecting Identification Accuracy (Short Paper)**

Andreas Lanitis et al.

Abstract:

The ability to identify the artifacts that a museum visitor is looking at, using first-person images seamlessly captured by a wearable camera can be used as a means for invoking applications that provide information about the exhibits, and at the same time, it allows the analysis of visitors' activities. In this paper, a system utilizing a deep network for identifying paintings in a museum environment is presented. As part of the efforts to optimize the performance of the system, an investigation aiming to determine the effect of different conditions on the artwork recognition accuracy in a gallery/exhibition environment is presented. Through the controlled introduction of different distractors in the virtual environment, it is feasible that we assess the effect on the recognition performance in different conditions. The results of the experiment are important for improving the robustness of artwork recognition systems, and at the same time the conclusions of this work can provide specific guidelines to curators, museum professionals and visitors, that will enable the efficient use of wearable cameras in museums.

■ **The Usability of Romanian Open Data in the Development of Tourist Applications. (Short Paper)**

Ilie Cristian Dorobăț et al.

Abstract:

The centralization of public data and the adoption of the open data concept are directions on which governors have begun to turn their attention more and more. Unfortunately, although the efforts in this direction are increasing, the Romanian public authorities offer access, mainly to semi-structured or unstructured data, which only makes their use more difficult. Only for data on museums and collections in Romania, two web portals are available, a data set in CSV format and a series of other data sets structured according to the LIDO XML Schema. In order to use these data sets, we had to consolidate them using both specific techniques for browsing and pre-processing them, and using the eCHO framework, through which the digital representation of classified cultural assets was migrated to Linked Data. Finally, the data resulting from the consolidation process was used to develop a web application through which users can more easily view this information and, based on it, create their own tourist routes directly from the application.

Reproduction Techniques and Rapid Prototyping in CH

▪ **Rapid prototyping to increase museum experience and accessibility. Palazzo Mazzonis' atrium in Turin: the work in progress Project (Short Paper)**

Francesca Ronco et al.

Abstract:

The research focuses on the use of digital fabrication techniques (CNC milling machine) to realize a tactile architectural model, in a "Design for All" perspective. The experimentation has been carried out on the vaulted system of the atrium of Palazzo Mazzonis in Turin.

▪ **BIM & rapid prototyping for architectural archive heritage (Short Paper)**

Giulia Bertola et al.

Abstract:

The present work intends to show a rapid prototyping experience carried out, starting from a three-dimensional model realized with the Revit 2021® software of the never realized project of the "Due ville a Capri" by the Turin architect Aldo Morbelli. The scale model was developed through the application of two digital manufacturing techniques: additive, the Fused Deposition Modeling (FDM), used for the buildings and for the external built elements made of plastic and subtractive, the Laser Beam Machining (LBM), for the slope on which the two buildings stand, realized through the superimposition of cardboard layers. The research after a first phase of redesign of the archival documents of the project in Revit 2021® focused on the preparation of the file for the creation of the real model, defining the printing scale, the materials, the exporting the file in STL format and the necessary operations to repair the file using Autodesk's software for additive manufacturing, Netfabb®.

▪ **The vault with intertwined arches in Castle of Racconigi: 3D digital reconstruction (Short Paper)**

Fabrizio Natta et al.

Abstract:

The complex approach of Guarini to each discipline (Geometry, Architecture, Philosophy, Astronomy) finds important development in his method of implementing vaulted systems. The importance of this architectural element, which Guarini reminds as "the main part of the buildings", is reflected in the new taste of the civil architecture of the period. It culminates in the main halls of several palaces where a high level of architectural choices has to be dedicated. The design by Guarini for the vault in the Hall of Honor in Racconigi Castle is documented in a single drawing representing the hall's cross-section. Guarini devotes particular attention to the drawing, both from the geometric and the representative point of view. Based on this drawing we want to propose, through the most recent digital modelling and visualization methods, a three-dimensional reconstruction of this unrealized work. The analysis method involves an in-depth examination of: Guarini's theory and his systematic approach to vaulted structures, linking Architecture and

Geometry, the problems of design the artifacts, the comparison with similar shapes designed by the architect. Through a method of representation based on geometrical principles, the aim of this paper is to give evidence – and a three-dimensional visualization – of a case study documented by an archival source, already analyzed by historians.

▪ **Cross information improvement for an H-BIM Common Data Environment (Short Paper)**

Marco Lorenzo Trani et al.

Abstract:

In the construction community, the BIM approach to design, is well-known, even if still not completely adopted. Nevertheless every design team using BIM often seems to act in its own way. In addition, the practical experience of the Con.Si.Lab. research team, when involved in design projects, is a huge lack of information flow through different design disciplines. This issue has been evaluated as a sensible obstacle towards quality especially in H-BIM projects, where construction site problems could create loss in time and money. This research therefore aims to create an original standard information flow, able to structure designers' relationships starting from an information collection responsibility award, given to them by the BIM coordinator at the early beginning of design activities, using some dedicated synopsis tables. The team's research method had an empiric approach through many years of experience in Historical Building construction sites design and management using BIM (i.e. H-CoSIM, Historical Construction Site Information Modelling). The case histories collection, enabled the definition of the presented information flow, based up on an ergotechnic parameters list gradually implemented and tested in many different sites. These parameters objects tables have been recently presented at the Italian Standard Body (UNI) in order to be enforced in a new release of the Italian standard UNI 11337, that provides two type of CoSIM: one at the design stage and one at the execution stage.

▪ **Digital 3D Modelling for Heritage Research and Education from an Information Studies Perspective (Short Paper)**

Sander Muenster et al.

Abstract:

Since more than 30 years digital 3D modelling methods have been used to support research and education about heritage and history. While an investigation on these topics is usually done from a perspective of digital humanities and cultural heritage, I investigate this topic by employing information studies methods from scientometrics, user behaviour research, and information practices. This article shows research questions and key findings from 15 completed studies that are part of an ongoing postdoc thesis work. Incorporated studies report about scholarly communities, usage practices, methodologies, technologies as well as design implications and educational strategies.

Thursday 05th November 2020

TIME	SESSION
09:00 - 10:30	<p>EuroMed 2020 – SHORT PAPERS</p> <p>Preservation and Use and Re-use</p> <p><i>e-Libraries and e-Archives in Cultural Heritage</i></p> <p><i>Virtual Museum Applications (e-Museums and e-Exhibitions)</i></p> <p><i>Visualisation Techniques (desktop, Virtual and Augmented Reality)</i></p> <p><i>Storytelling and authoring Tools</i></p> <p><i>Tools for Education</i></p>

Preservation and Use and Re-use

e-Libraries and e-Archives in Cultural Heritage

▪ **Atlas of the Viennese Avantgardes - Internship (Short Paper)**

Giada Di Trinca et al.

Abstract:

The Atlas of Viennese Avantgardes is a project for an online platform which will serve as a database research tool for mapping temporal and spatial developments of the Viennese Avant-gardes in the second post war. Such presentation sums up two months of e-learning activity which dealt with questions related to digital libraries, archives and catalogues, how explore, clean, transform data and how encode visual data in digital form. The main study was focused on Sari Documentation, a project which uses a semantic web infrastructure to record and expose reference resources useful for Digital Art History & Digital Humanities projects, CIDOC Conceptual Reference Model (CRM), a theoretical and practical tool for information integration in the field of cultural heritage and Atom, a text editor to collaborate on code in a faster, smart and flexible way through GitHub.

■ **Language Independent Searching Tools for Cultural Heritage on the QueryLab Platform (Short Paper)**

Isabella Gagliardi et al.

Abstract:

The paper describes the tools for searching and visualizing local and web inventories related to intangible and tangible cultural heritage in the QueryLab platform. The pandemic outbreak has made it more evident the need to offer users tools to query and enjoy interesting and educative websites in their homes. The tools presented are useful for users who are not experts in the domain of the inventories, offering predefined queries and semantic query expansion to interact with the archives. The visual suggestions, in the form of word clouds of tags of the selected archives, help in querying the archives and retrieving the elements that come closest to the user's interests. As one of the QueryLab aims is to continue to add inventories, in the languages they are stored, visual suggestions help to overcome the language distance between the archives and the users to allow an easy and successful interaction. This paper presents QueryLab tools for searching, browsing, and displaying multimedia data, with some preliminary results.

■ **Co-designing Digital Engagements with Cultural Heritage Sites in Africa: A research road map for the Brandberg National Monument Area, Namibia. (Short Paper)**

Martha Mosha et al.

Abstract:

This paper outlines the design of a research project that would focus on the Brandberg National Monument Area, in Namibia, Southern Africa. The project seeks to find solutions using co-design action research, with the local communities within the vicinity of the site and in the country. While an open online database is already available, with an extensive collection of archaeological materials found within the site, the project will explore how to re-use and re-purpose such materials to present them not only to researchers and experts, but also to locals and to (international) tourists. In order to do so, local voices are to be fully integrated within the presentation(s), and local involvement will be of the utmost importance to manage communication practices as well as travellers' flows. The ultimate goal is not only to come up with different digital engagement tools, but also to end up with a digital engagement and governance framework for heritage sites, which could work in the African context.

Virtual Museum Applications (e-Museums and e-Exhibitions)

■ **Virtual depot. A dynamic representation of a museum storage facility. (Short Paper)**

Marzia Loddo et al.

Abstract:

Museums are the keepers of human cultural and anthropological heritage and attract many visitors every day. Most of them do not know that what they see is only the tip of the iceberg. In fact, for most museums, 90% of the collection is

kept in storage facilities. Those are not always seen by the general public and remain neglected spaces in many museums, playing only a marginal role in museum activities. However, these depots are the cores of museums and are more than mere repositories. Depots are also locations where many activities take place, such as exhibitions, education, and research programs. The use of Augmented and Virtual Reality (AR and VR) is a tool in our holistic educational toolbox. Spatial media enable entire new ways of storytelling that involve the learner in highly situated, interactive learning experiences. One of the aims of a broad ongoing research called "DIPOT: Digital Depot. A dynamic 3D representation of art collection storage facilities as a learning resource to build critical engagement and improve future design" is to create a 3D model and/or a 360° image of a museum storage. The development of this novel imaging systems will clarify the role of new technologies in the perception and understanding of cultural heritage; specifically, to how 3D virtual replicas of museum deposits can redefine museum practices, promote better understanding for the general public and educate a future generation of designers. Two case studies were considered for this project: the Collectie Centrum Nederland and the National Royal Library in The Hague (both in the Netherlands). Methods, preliminary and expected results of this project will be described and discussed in the short paper.

▪ **Covid -19 and Greek museums. Digitality as a mean of promoting Cultural Heritage during the Coronavirus period. New ways of expression. (Short Paper)**

Markella-Elpida Tsihla et al.

Abstract:

The coronavirus pandemic, scientifically named Covid-19, was a unique phenomenon that affected the lives of billions of people around the world. The problem persists, with a happy ending not yet fully visible, even if, in due course, medical science discovers ways to reduce or eliminate this pandemic. The negative impact of the disease on people's lives has been enormous, with millions of people dead, whilst at the same time it has affected the global economy as well as social cohesion, making life difficult for people. Culture was also a major victim of the pandemic, as the direct contacts of artists and experts with the works of art of world cultural heritage were immediately cut off. Greece felt the negative consequences in this area, as its history and culture are linked to tourism and the promotion of its cultural heritage has suffered a major blow. Masterpieces from the past, of great historical importance and aesthetic value, were found in isolation as the difficulties of being approached by the international public seemed to be unsurpassed. However, "Necessity and the gods are convinced", as the ancient Greeks said, so the Greek museums entered - with an unprecedented dynamism - in modern technologies and in the age of digital image, in order not to stop the "contact" of the public with the rich world of art. Therefore, at an extremely fast pace, special virtual tour programs were implemented and displayed in museums and places of culture and as it turned out, the attendance showed high numbers, as the cultural project became a "product" with the aim to be perceived by the cyber public as an intangible object with dimensions outside the "established" aesthetic pleasure. Furthermore, the result is considered to be particularly encouraging as the operation of the museums has acquired a new dynamic.

▪ **Reliability Analysis of an Evaluation Experiment on Cultural Websites (Short Paper)**

Katerina Kabassi et al.

Abstract:

This paper describes the evaluation experiment of the websites of museums' conservation labs. For this purpose, an experiment has been implemented with the participation of 81 subjects and a multi-criteria decision-making model has

been used for processing the results and draw conclusions about the electronic presence of the conservation labs of museums. However, the main focus of the paper is on performing an analysis of the reliability of the whole experiment. This analysis involved two tests, one for examining the reliability of the sample used in the evaluation experiment and another for examining the reliability of the questionnaire provided to the subjects. In the first test, the reliability of the participants was evaluated by calculating the Interclass Correlation Coefficient, to see whether their answers were consistent. During the second test, reliability analysis was performed for the questions of the questionnaire. The results of the analysis involved reliability testing the application of the questionnaire to each different website and calculation of the Cronbach's Alpha.

Visualisation Techniques (desktop, Virtual and Augmented Reality)

▪ **Augmented Reality Cultural Route at the XerosRiver Valley, Larnaca, Cyprus (Short Paper)**

Eleftherios Ioannou et al.

Abstract:

Landscape studies have evolved into a significant branch of historical archaeological research, by placing emphasis on the ecological, economic, political and cultural values of pre-modern settled and sacred landscapes. The aim of our work is to support the systematic exploration of landscape archaeology in the Xeros River valley in Cyprus, through time, from prehistory to today, through the development of an Augmented Reality (AR) application. The AR application supports the exploration of pre-modern monuments and archaeological sites in the Xeros River valley, serving as a guided tour for visitors of the area. By employing image recognition and utilizing a location-based practice, the application provides the users with an immersive and educational experience, enabling the narration of the historicity of the landscape and the fate of religious and other monuments of the past 1500 years.

▪ **Doing more with your Cultural Heritage collections. (Short Paper)**

Sophie Dixon et al.

Abstract:

Galleries, Libraries, Archives, and Museums are increasingly using photogrammetry to digitise objects from their collections as 3D models. These models present an exciting opportunity to create new and engaging experiences which would not be possible with their real-life counterparts. Mnemoscene.io create web-based and immersive experiences to engage and inspire. They have delivered projects using photogrammetry and 3D collections, from educational applications to storytelling, from web-based XR, to fully rendered VR environments. This poster session presents a number of case studies and possibilities for making more from your 3D Cultural Heritage collections.

▪ **Digitizing the Neolithic Hypogeum (Short Paper)**

Jonathan Barbara et al.

Abstract:

The Hypogeum of Hal-Saflieni is a 6000 year old Neolithic burial place whose microclimate is threatened by the presence of thousands of visitors all year round. Beyond digital preservation and accessibility, this project aims to provide a highly accessible experience to the virtual tourist or academic. This short paper reports on progress in faithful illumination and acoustics together with navigation aids supported by a real motion platform towards a mixed reality immersive experience. Lightweight variations such as a 360° VR film and a 360° still-based gaze-driven navigation mobile app further make such precious cultural heritage available to the wider public and serves as a basis for future enhancements towards a more immersive virtual cultural heritage experience.

Storytelling and authoring Tools

▪ **"Exhibit" - a new tool for creating online narrative-led presentations with images and 3D models using IIIF (Short Paper)**

Edward Silvertown et al.

Abstract:

"Exhibit" is a new tool for creating engaging interactive presentations. Built by Mnemoscene in partnership with the University of St Andrews, Exhibit enables users to load images or 3D objects from any IIIF-supporting online catalogue via the Universal Viewer. These can then be woven into presentations using Exhibit's "zoom and describe" feature. Educators can create template Exhibits for their students to duplicate and remix. Exhibits can be shared via a public URL or embedded elsewhere, such as in a Moodle assignment submission. Exhibit's mission is to connect the world's digital collections by making it easy to create engaging narratives. Practical tool for information integration in the field of cultural heritage and Atom, a text editor to collaborate on code in a faster, smart and flexible way through GitHub.

▪ **The potential of implementing interactive storytelling experience for museums. (Short Paper)**

Saif Alatrash et al.

Abstract:

This paper presents a variety of theoretical solutions that can benefit museum professionals to provide a better contextualisation between the displayed objects and the visitors experience overall. The article examines existing academic literature related to interaction principles in museum environments. Different models of communication are important to understand the fundamental concept of interpretation between the visitors and museum object. The utilisation of gamification concepts in heritage settings improves the way users engage with the displayed content. The article shows different theories relates to gamification and storytelling approaches as a way to improve the audience motivation and immersion during the VR experience.

Tools for Education

▪ **Creative and Critical Thinking Approach in Education - The Creative School Project (Short Paper)**

Pier Giacomo Sola et al.

Abstract:

The Creative School project explores the possible mobilisation of digital cultural heritage and engagement with maker spaces models, as tools to create unusual and exciting learning opportunities. The main beneficiaries of the project include primary and secondary school teachers, who, through engaging with the project will become equipped with the skills necessary to facilitate pedagogical strategies for creativity and critical thinking. Children and young people involved as participants in the Creative School project will develop the skills required to respond to the challenges offered by the Creative School curriculum.

▪ **The Network of the Italian University Museums for the diffusion of the scientific culture. (Short Paper)**

Elena Corradini et al.

Abstract:

The first Italian University Museums Network, has been constituted in 2012 for a first project, approved and financed by the Ministry of the University and Research, coordinated by Modena and Reggio Emilia, in order to monitor the most significant museum's collections, to catalogue their specimens with the national standard of the Central Institute for the Catalogue and the Documentation for the General Catalogue of the Italian Cultural Heritage and to create 80 narrative paths dedicated to environments, landscapes, stories, history of scientific instruments. All the paths have been inserted in the webportal of the Network realized for the project (www.retemuseiuniversitari.unimore.it) structured in order to contextualize, through both historical and territorial frameworks, significant nuclei of the collections and to strengthen the semantic value of the specimens identified and chosen by individual museums for their specific value within the four general themes and to create multiple contexts that connect and intertwine to build relationships between objects that are not always well understood or readable from their musealization. The Network has gradually become aware of the great potential to develop educational programs and the diffusion of scientific culture: in 2015 a second project was started, that was approved and financed by the same Ministry, dedicated towards orienting the students to the scientific methods and culture. The museums realized 56 experiential educational paths through the individuation and the sharing of operative methods, the adoption and the use of common languages and tools, with specific attention to the information technologies dedicated to three principal themes, biodiversity, color and time, and to 7 subthemes, and are published in the second section of the Network webportal.

▪ **ANTS: From History of Science to Future of Science (Short Paper)**

Manolis Wallace et al.

Abstract:

FAB LAB (the Knowledge and Uncertainty Research Laboratory at the University of Peloponnese) is designing and implementing Argolida's Next Top Scientist (ANTS), a history of science program for minority students. ANTS draws on the biographies of celebrated scientists such as Albert Einstein and Marie Skłodowska Curie to empower students that are often found ostracized by both school and society. In a sense, the program uses the history of science as a tool to foster the future of science.

▪ **Underground Built Heritage as catalyser for Community Valorisation (Short Paper)**

Giuseppe Pace et al.

Abstract:

The COST Action CA18110 Underground4value (www.underground4value.eu) aims to promote Underground Built Heritage (UBH) as a valuable resource and realising its full potential to support local communities' development. To that scope, it develops tools for local communities' empowerment, which must overcome potential knowledge, technological and financial gaps by connecting local societies to the global community. Innovative digital technologies help to reduce these gaps, by simplifying UBH related surveying and dissemination practices, by supporting different stakeholders with historical and archaeological backgrounds, and integrating explorations and surveys. Emerging technologies, such as three-dimensional (3D) computer modelling and different sensing techniques, could become a primary thrust for underground heritage research and development (e.g. 'seeing through the ground'), supporting communities to achieve flexibility and resilience in UBH valorisation. The first year case studies demonstrated the importance of filling the digital gap.

▪ **Scientific Investigation on movable Cultural Heritage (Short Paper)**

Maria Luisa Vitobello van der Schoot et al.

Abstract:

The aim of this paper is to illustrate parts of a 45 pages scientific investigation, delivering a significative sample of the results achieved according to the authentication methodology resulting from EU funded Research Project AUTHENTICO – CT-044480, coordinated by EJTN GEIE. Content has been restricted according to number of pages allowed in the call. Advanced scientific instrumentation allows in-depth examination of the artefact while results are interpreted by scientific and technical researchers, with established competences on movable Cultural Heritage.

▪ **The Application of Digital Integration Strategy for Cultural Heritage Conservation – The Case Study of Qionglin Settlement in Kinmen County (Short Paper)**

Alex Yen et al.

Abstract:

Integrated preservation is an important trend in the maintenance of cultural heritage, and borrowing value is the benchmark. Preserving the tangible and intangible value, consulting public participation and digital technology activation are all important tasks. In the process, mature digital tools are used for dating and assist to strengthen preservation work is an important key internationally at this stage. This research takes the reconstruction of the historical site program- Reconstruction of Qionglin's Millennium Settlement History as an example to explore how to plan and individually introduce and integrate strategies for digital technology in each project. The results of the study found that the introduction of digital technology into the sub-projects accelerate efficiency but also the effectiveness of the program. At the same time, the results of the program can be integrated through pre-planning and placed on the geographic information system (GIS) platform, fully interactive and efficiently.



CHANGE- ITN Project Presentations:

▪ **Monitoring Munch's monumental Unvarnished oil paintings: exploring Novel change documentation methods and Cleaning techniques via Hyperspectral imaging (Presentation)**

Jan Cujatar.

▪ **Imaging techniques for change documentation and monitoring of stained-glass windows (Presentation)**

Agnese Babini.

Thursday 05th November 2020

TIME	SESSION
14:25 - 15:50	EuroMed 2020 – PROJECT PAPERS
	DATA Acquisition and Processing
	<i>Digital Data Acquisition Technologies in CH/2D and 3D Data Capture Methodologies and Data Processing</i>

DATA Acquisition and Processing

Digital Data Acquisition Technologies in CH/2D and 3D Data Capture Methodologies and Data Processing

▪ **Recognizing the Design Patterns of Complex Vaults: Drawing, Survey and Modeling. Experiments on Palazzo Mazzonis' Atrium in Turin (Project Paper)**

Roberta Spallone et al.

Abstract:

This paper shows the results of research advances on complex vaulted systems produced by the integration of laser scanner survey techniques and three-dimensional modelling for the geometric interpretation of built architecture to recognize the geometric matrices of the design conception. The integration between TLS techniques and digital modelling methods led to the definition of new workflows, aimed at optimizing the use of data and at refining the quality of the geometrical interpretation. The process incorporates the traditional activities of the freehand drawing of eydotypes, aimed at a deep understanding of the peculiar characteristics of the artifact. In particular, from these procedures new opportunities for the research arise to better understand the relationships between survey data, geometric matrices and compositional rules. The case study presented here, the atrium of Palazzo Mazzonis in Turin was chosen among a small number of atria that present characteristics of originality and uniqueness, in a panorama of realizations strongly characterized by compliance with well-established compositional schemes.

■ **Autonomous Aerial Systems in Service of Cultural Heritage Protection from Climate Change Effects (Project Paper)**

Artur Krukowski et al.

Abstract:

The article reports on both past and ongoing work in such research projects as SCAN4RECO or ARCH, both funded by the European Commission under the Horizon 2020 program. The former one concerns multi-model and multi-spectral scanning of Cultural Heritage (CH) assets for their digitization and conservation via spatio-temporal reconstruction and 3D printing, while the latter one aims to support better preservation of cultural heritage areas from hazards and risks, both natural and human-borne ones. Both projects have adopted co-creation methodologies to help pilot hosts (preservation institutions and cities) to save their cultural heritage from the effects of progressing climate change effects. This included developing disaster risk management frameworks for assessing and improving the resilience of historic areas to climate change and natural hazards. Tools and methodologies have been designed for local authorities and practitioners, urban population, as well as national and international expert communities, aiding authorities in knowledge-aware decision making. In this article we focus on presenting novel approaches to perform 3D modelling of object geometry using 3D photogrammetric methods using autonomous and automatic control systems for achieving very high model accuracies using consumer types of devices, attractive to both professionals and hobbyists alike. We also present practically adopted approaches for remote monitoring of weather and climate effects in local and global scales as well as means of assessing possible negative effects that such natural climatic effects might pose on the level and speed of degradation of Cultural Heritage.

■ **3D Thermal Mapping of Architectural Heritage (Project Paper)**

Efstathios Adamopoulos et al.

Abstract:

The generation of thermal imaging derivatives with metric quality has always been an issue for architectural heritage diagnostic investigations. Multidisciplinary projects often require integrating multi-sensor information—including geometric and high-resolution temperature data—to extract valid conclusions regarding the state-of-preservation of historical buildings. Towards this direction, the recent technological advancements in thermal cameras and three-dimensional (3D) documentation instrumentation and software have contributed significantly to assisting the rapid creation of detailed 3D thermal textured results, which can be exploited for non-destructive diagnostical surveys. This paper aims to briefly review and evaluate the current workflows for thermographic architectural 3D modeling, which implement state-of-the-art sensing procedures and processing techniques, while also presenting some applications on case studies of significant heritage value, to help discuss current problems and identify topics for relevant future research.

■ **Crowd-based Tools for Indirect Condition Assessment and Conservation of Cultural Heritage (Project Paper)**

Adriana Marra et al.

Abstract:

The enhancement of digital technologies, the diffusion of the crowdsensing paradigm envisage useful applications to cultural heritage and depict novel approaches to the condition assessment and forms of conservation and preventive conservation. A large amount of inhomogeneous data is available to the community and, therefore, effective and reliable tools able to facilitate their processing and management are needed to design proper safeguarding and valorization measures. The present paper discusses a methodology that integrates traditional approaches for the knowledge and condition assessment of cultural heritage with those based on well-known web applications available at large scale on a number of different devices. In other terms, it is investigated the feasibility and the reliability of the crowd-sourcing paradigm applied to the acquisition of data related to the current condition of architectural and valuable assets. The methodology is applied to two relevant, but different examples of the International cultural heritage; a flexible and scalable database has been populated. Processing of the data provides encouraging results both in the area of the indirect survey and in the area of preventive conservation.

■ **Conservation Process of Porta Tiburtina, Rome: a Tool to Map, Protect, and Requalify Identity. (Project Paper)**

Jui Ambani et al.

Abstract:

Porta Tiburtina is a historic gate within the Aurelian walls in Rome. It is connected to an ancient Augustan arch that carried three aqueducts. This arch additionally served as an opening to an ancient street, Via Tiburtina, that connected Rome, and Tivoli. This paper describes the methodology used to understand this vast subject of the practice of Heritage Conservation in the context of the regular practice of architecture that has either been largely misunderstood or, at worse, regarded as architecture with an outdated twist. It focuses on a three-stage study process starting from the current state, followed by an elaborate historical data collection that leads to the declaration of the need for intervention. Phase I talks about the awareness of the current context, both urban and structural, and the architectural features that are key to acknowledging the threats and dangers to the monument. The next phase focuses on historical data collection and arrangement that helps understand the value lost on the monument and documents every change and transformation it has been through to make a more informed decision. The final stage is an intervention that tends to be respectful, minimal, and in-context. It demonstrates the value of a methodology organized on an individually tested analysis to explore and confirm different aspects of the historic development of the monument. The main question it tries to answer is, how does an architect decide whether to conserve, preserve, restore, or reuse while retaining the memory and identity of the monument?

■ **Evaluation of soil loss by water in archaeological landscapes by using the (R)USLE Model and GIS. The case study of Paphos district, Cyprus (Project Paper)**

Nikoletta Papageorgiou et al.

Abstract:

Soil erosion is one of the most significant environmental issues, as it seriously threatens archaeological sites and monuments. In recent years, several models have been used in the relevant scientific literature in order to estimate soil erosion rates. The models range from empirical to physical or process-based and differ significantly in complexity, accuracy, inputs and outputs. Among these, the Revised Universal Soil Loss Equation (RUSLE) has become the most commonly used in different environmental conditions and on varying scales. The present study calculates average annual soil erosion in terms of spatial and temporal patterns based on the Revised Universal Soil Loss Equation (RUSLE) model, combined with Geographic Information Systems (GIS) in the area of Paphos District. This study also implemented satellite remote sensing images and available data sources such as meteorological data, a digital elevation model (DEM), land use and soils maps for soil erosion analysis. The whole methodology is based on the estimation of soil loss per unit area and takes into account specific parameters such as rainfall factor, steepness and slope length factor, cover management, practice factor as well as soil erosion factor. The results indicate that the mean annual soil erosion was estimated from 0 to 235.532 t/ha.

■ **Documentation and 3D Digital Modelling: The Case of a Byzantine Christian Temple and an Ottoman Muslim Mosque in Ioannina City, Greece (Project Paper)**

Athina Chroni et al.

Abstract:

The specific paper forms part of the Postdoctoral Research Project focusing on Ioannina city's Ottoman period (1430-1913) and its multicultural profile as depicted in buildings, public or private, religious or secular, conventional or more elaborate, each having its own historical and architectural interest. Unfortunately, most of the landmark buildings have been destroyed due to natural disasters, religious hatred and the unbridled, often uncontrolled modern constructions. However, the existence and form of several of those edifices survived thanks to fragmentary information of various kinds, while their position in the urban web and their dimensions can be clarified, in several cases, by their comparative studies with buildings recorded at the same representations whose location and dimensions are known or buildings preserved until today. Under this perspective, a variety of data like historiographic, bibliographic, archaeological, cartographic, topographic, remote sensing imagery, optical displays, travelers' descriptions, other literary sources, local legends, inhabitants' interviews have been collected, analyzed, cross-examined and digitally processed, thus leading to the development of a Geographic Information System, the 3-D landmarks digital models, a web data base and QR coding at the specific sites, where the landmark buildings used to stand, thus connecting the intangible (digital) with the tangible (physical space) and achieving interaction of the project with the local community. Moreover, cultural walks within the city's urban web, related to the project's axis are also proposed.

■ **Motion Capture the Performance of Taiwanese Folklore Ritual – Hsinchuang Dizang Temple's Lead Generals (Project Paper)**

Chao-Shiang Li et al.

Abstract:

Taiwanese temples hold their parades for birthdays of the divinities according to certain dates of the lunar calendar. These parades and the relevant rituals are the crucial intangible heritage to Taiwan Culture. During the ritual festival, the leaders of the parade called 'Din Tao (Leader of the Parade)' who wear makeup on their faces and unique religious costumes along with the distinctive movements. They are the clear-cut characters in folklore but also the vivid figures widely adapted by dramas, animations, and video games in Taiwan's popular culture. In the New Taipei City, the Hsinchuang Dizang Temple (De Záng An), a Buddhist temple dedicated to Kṣitigarbha Bodhisattva was built in order to rest the neglected ghosts since the mid-eighteen century Taiwan. The temple's annual neglected ghost worship ceremony has been running for over a century. This ritual activity is the listed intangible cultural heritage including the ritual performance of 'Lead Generals (Guān jiāng shǒu)' which is originated from here. Due to the crowd and limited space of the temple courtyard, it is lacking in a comprehensive documenting of the details of performers' movements. In order to secure the Lead Generals' inheritance and enlarge the application of edutainment, this study adopts the Optical Motion Capture as the digital documentation approach. Through the tracking technique of Optical Motion Capture, it digitalizes the locomotion and performance of parade formations into 3D motion information. The information has transformed and shared via the 3D-model platform, Sketchfab. In comparison with the traditional mentor-mentee materials (e.g. the textual narrative, or 2D images and video recording), 3D digital motion information is able to more elaborately present both the dynamic picture of parade formations and the individual figures' movements together with the time and spacial features. The above outcome offers a better practice in the education programs, animations, interactive performance, and the purpose of intangible cultural heritage preservation in the Post-COVID-19 World.

Thursday 05th November 2020

TIME	SESSION
16:10 - 17:30	EuroMed 2020 – PROJECT PAPERS
	DATA Acquisition and Processing
	<i>Digital Data Acquisition Technologies in CH/2D and 3D Data Capture Methodologies and Data Processing</i>
	<i>Remote Sensing for Archaeology and Cultural Heritage Management & Monitoring</i>
	Modelling and Knowledge management
	<i>Interactive Environments and Applications</i>
	<i>Reproduction Techniques and Rapid Prototyping in CH</i>

DATA Acquisition and Processing

Digital Data Acquisition Technologies in CH/2D and 3D Data Capture Methodologies and Data Processing

▪ **Terrestrial laser scanning and Cad for measuring deformations of cultural heritage structures. case study of El Atik's minaret in Setif- Algeria-. (Project Paper)**

Rania Mechiche et al.

Abstract:

Today, digital technologies represent an important tool for emergency preparedness of any heritage at risk. The use of devices such as 3D modelling makes it possible to recognise endangered heritage. This paper deals with the terrestrial laser scanning survey (TLS) using CAD and point clouds for calculating deformations of cultural heritage structures. In doing so, this study focuses on one of historic key buildings – that look very vulnerable-, in Setif's city in Algeria: the minaret of El Atik's mosque. A major novelty is the use of cross section method based directly on high accuracy model generated from the point clouds to determine the tilted direction and tilted distance along the tower of the minaret of El Atik's mosque regarding to the main axis of its base.

▪ **Wrap-up synthesis model from high-quality HBIM complex models, and specifications, to assess Built Cultural Heritage in fragile territories (Arquata del Tronto, earthquake 2016, the church of St. Francesco, IT) (Project Paper)**

Raffaella Brumana et al.

Abstract:

The paper intends to define the different levels of quality models achieved to assess architectural heritage in fragile contexts as the earth quaked territories, proposing to reverse the BIM logic 'simple-to-complex' in favor of a complex-to-simplex one targeted to HBIM. In order to perform a preservation plan, given the complexity of a damaged heritage, the simplification can't be the starting point, but the synthesis of the detailed levels of understanding obtained: the case study of St. Francesco church, damaged by the earthquake occurred in 2016, is presented to highlight the deliverables submitted as part of the support to the preliminary preservation design project and decision-making process carried out by the research group of the Politecnico di Milano for the Municipality of Arquata del Tronto. The high level of geometry description acquired by the surveying (TLS, MMS, Photogrammetry) has been finalized to analyze the out-of-plumbs and structural behavior, enriched by the diagnostic analysis detecting the materials and construction techniques, supported the recognition of the stratigraphic volume units and construction phases to better understand the transformations across the centuries integrating the direct data sources with the indirect ones (documents, archives). While in the traditional BIM logic the level of enrichment progressively crosses the Level of Development phases (LOD100-500) by adopting a progressive parallel Level of Geometry (LOG100-500), the paper proposes scales model definition (GOA100-50-20-10) and LOG specifications adapted to the LOD (Design Development, Preservation Plan) reversing the logic and introducing a synthesis model that collects the different analysis, a wrap-up model, to be used together with the detailed high scale models (LOG200-300-400-100), for BIM-to-FEA or BIM energetic analysis, and within LOD600 VR.

Remote Sensing for Archaeology and Cultural Heritage Management & Monitoring

▪ **Cultural Master Plan Bamiyan (Afghanistan) -- A process model for the management of cultural landscapes based on remote-sensing data (Project Paper)**

Georgios Toubekis et al.

Abstract:

The Cultural Landscape and Archaeological remains of the Bamiyan Valley are inscribed on the UNESCO World Heritage List since 2003. An international safeguarding campaign is active for its preservation, including remains of the Buddha figures destroyed by the Taliban in 2001. Efforts are underway to set up an effective management system for the historical areas within a wider landscape to approach balancing conflicting uses and demands. Based on detailed high-resolution satellite imagery and accompanying ground surveys, a comprehensive inventory of vernacular settlements, traditional water systems, and historic cultural remains was compiled. The Bamiyan Cultural Masterplan has been elaborated as a zoning proposal to support future planning processes in Bamiyan. A GIS System has been set up as a basis for managing planning and monitoring activities in the future. The current condition of the archaeological remains of Bamiyan has been documented with different remote sensing and high precision 3D documentation methods. Within the field of cultural heritage management, Virtual Reality technologies are an innovative approach for the documentation and presentation of complex architectural objects, especially in landscape settings. This includes a digital reconstruction of the destroyed Small Buddha (38m) Figure of Bamiyan integrated into the high-resolution 3D model of the niche and the cliff. The composite model of previous and actual conditions serves as a communication and planning tool for future consolidation works both for experts and the interested public.

▪ **Monitoring Marine Areas from the International Space Station: the Case of the Submerged Harbor of Amathus (Project Paper)**

Daniele Cerra et al.

Abstract:

The submerged harbor of Amathus in Cyprus is a sensitive cultural heritage requiring special attention in the frame of Marine Spatial Planning. The monitoring of water depth in the surrounding area can raise awareness on effects, such as shoreline erosion, which could lead to a deterioration of the relics. This paper assesses the quality of bathymetric maps around the site derived from the DESIS hyperspectral sensor mounted on the International Space Station. The depth values are compared to products derived from traditional multi-spectral sensors and assessed with LiDAR measurements acquired in situ. An imaging spectrometer such as DESIS would be able to derive additional water quality parameter such as phytoplankton concentration, assessing at the same time eutrophication and pollution in this sensitive area.

■ **A GIS and Remote sensing approach for desertification sensitivity assessment of cultural landscape in Apulia region (Italy) (Project Paper)**

Mattia Previtali et al.

Abstract:

Climate change is posing new challenges to cultural landscapes. Indeed, rapid climate modifications can significantly interfere with the link existing between nature and man work typical of cultural landscapes. This problem is even more fundamental for those areas characterized by accelerated climatic changes like Mediterranean areas. For those regions the definition of proper methodology for sensitivity evaluation to land degradation is a key element to promote new strategies and policies. This work presents a new methodology which integrates GIS and remote with environmental models to simulate land degradation processes and to provide a comprehensive index (Integrated Desertification Index, IDI) of desertification for the Apulia region in Southern Italy. After an extensive analysis of both the conditions and the evolution of natural features in the study area, through spatial data investigation, a suite of appropriate indicators of land degradation have been identified on the basis of their applicability and sensitivity to environmental processes. The following five indicators were considered: overgrazing pressure, drought pressure, water erosion, vegetation condition and soil salinity. To evaluate them both existing Open GIS and statistical data, as well as remote sensing images have been combined into a unique indicator in order to evaluate the most vulnerable areas to land degradation in the Apulia region.

Modelling and Knowledge management

Interactive Environments and Applications

■ **Route Generator for Integrating Cultural Heritage to Smart City: ontheroute (Project Paper)**

Ceylin Yıldırım et al.

Abstract:

The city is a whole with both tangible and intangible cultural heritage values. Smart cities designed to overcome the challenges that arise for all stakeholders and elements of the city through global urbanization, technological innovations and various urban policies, should be designed together with the cultural heritage values that are part of the city. Cities that start to rapidly transform should aim for a change for urban dwellers without detaching them from their cultural context. In this study, a route planning proposal based on individual preferences will be developed on how "smart city" strategies can be implemented in order to strengthen, experience, ensure and protect the interaction between cultural heritage and visitors. For the transformation of cultural heritage values into "smart"; interaction with cultural heritage should be improved through advanced infrastructures in smart city. With this study, it is aimed to develop a user-oriented route generator integrated with city transportation data used to increase the visitor experience. As a field of study; Istanbul Esenler District, which has important historical and cultural values belonging to Byzantine and Ottoman Periods, has been chosen. In addition, the area has a strategic importance as a smart city in Turkey. With the proposed application, it is planned to provide simultaneous information about all cultural heritage values available to the visitor, convey visual information that has not been reached today and verbal historical explanations. At the same time, with this route generator, it is enabled to interact with cultural heritage by providing

the user with the opportunity to design routes and experience routes through smart city transportation data (bus, metro), current location and travel time.

▪ **Development of a virtual CH path on WEB: integration of a GIS, VR, and other multimedia data (Project Paper)**

Andrea Scianna et al.

Abstract:

Recent advances in computer science allowed people to explore new possibilities for the fruition of CH all around the world. The development of Geographic Information Systems (GIS) in the field of territorial systems and the evolution of Virtual Reality (VR) solutions opened new scenarios for the valorization of cultural goods. At the same time, recent advances in digital photogrammetry and 3D interactive navigation models on WEB-based on WebGL technologies offered new opportunities of digital fruition of CH. Considering this panorama, the presented work shows how the integration of these technologies gives a precious added value to the virtual fruition of CH. In particular, it has been considered a cultural path in the La Loggia district, located into the historic centre of Palermo. This area is rich in monuments, many of them not accessible to the public, within the I-ACCESS European Project. The starting idea was to enlarge and diffuse, as much as possible, the accessibility to the knowledge of cultural goods in a virtual way, stimulating at the same time their real fruition. The developed solution implemented a GIS platform HTML 5 based and freely available online from desktop and mobile devices. In the virtual tour, everyone could navigate inside the cultural path, accompanied by touristic information, and come and visit the indoor environments of the main monuments. This work offers a new approach to accessibility and represents an example of how new technologies could support the diffusion of knowledge of CH.

▪ **Kirini: An Interactive Projection-Mapping Installation for Storytelling about Mediterranean Beekeeping Heritagedata (Project Paper)**

Nikolaos Ioakeim et al.

Abstract:

Project Kirini is an autonomous interactive indoor exhibit, which utilizes the technologies of projection mapping and physical computing to highlight the cultural heritage of beekeeping in the island region of the Cyclades in Greece. The team members researched and collected material on the tradition and the techniques of beekeeping from the ancient times until today through bibliographies and physical interviews. After the completion of the research and organization of the information, the team designed four different types of interactive scenarios. Through a set of formative evaluations, several issues, comments and ideas emerged and iteratively implemented to enhance the prototype. Having gathered the results and the conclusions from the evaluations an interactive exhibit was produced and installed in public space.

Thursday 05th November 2020

TIME	SESSION
18:00 - 20:00	EuroMed 2020 – PROJECT PAPERS
	Modelling and Knowledge management
	<i>Reproduction Techniques and Rapid Prototyping in CH</i>
	Preservation and Use and Re-use
	<i>e-Libraries and e-Archives in Cultural Heritage</i>
	<i>Virtual Museum Applications (e-Museums and e-Exhibitions)</i>
	<i>Visualisation Techniques (desktop, Virtual and Augmented Reality)</i>
	<i>Storytelling and authoring Tools</i>
	<i>Tools for Education</i>

Modelling and Knowledge management

Reproduction Techniques and Rapid Prototyping in CH

▪ **Digital Humanities: Prototype Development for Balinese Script (Project Paper)**

Cokorda Pramatha et al.

Abstract:

In Indonesia there are more than 600 ethnic groups and 719 mother-tongue languages spoken. A significant 13 Indonesian mother-tongue languages have vanished and been forgotten as they are no longer used for daily communication. When a language is forgotten, not only is the structural aspect of the language lost, which becomes the main focus of the linguistic domain, but also the cultural and historical knowledge that is attached to the language. The Balinese language is a mother-tongue spoken on the islands of Bali and Lombok, and the Balinese script (Aksara Bali) is a traditional script that is used to write the Balinese language in the form of Balinese short stories, history (itihasa), proverbs, poetry, music, and spells (mantra) on the top of palm leaves (lontar). Recently, fewer members of the young generation of Balinese are able to speak this language due to its complexity and the widespread use of the national language (Bahasa Indonesia) in all levels of formal education. This study aims to preserve, protect, and continue the use of Balinese language and script by adopting modern technology that can be utilized by the younger Balinese generation. In this study, a physical non-QWERTY keyboard specifically for Balinese script has been designed, developed, and tested to work for multiple devices (e.g., computer, tablet, and smartphone), diverse operating systems (e.g., Windows,

macOS, iOS, and Android), and various applications (e.g., Word processor, instant messenger, and social media applications). Through consultation with professors from Udayana University with expertise in Balinese language and script, a total of 89 out of 185 Balinese scripts are included in our IT artefact that can be utilized for daily use.

▪ **Look Behind You! - Using a Face Camera for Mobile Augmented Reality Odometry (Project Paper)**

Jan Čejka et al.

Abstract:

Augmented reality applications provide new ways of presenting cultural heritage assets thanks to the recent advancement in the field of smart devices. Unfortunately, the construction of the hardware and lower computational power of mobile processors limit the potential of these applications. Namely, almost all current visual-inertial odometry libraries employed in smartphones, require the real tracked objects to be close and contain distinguishable features, which is an issue when observing large virtual structures outdoors, like historical buildings or objects on plain walls of halls or museums. This paper exploits the possibility of using the face cameras available in mobile devices for augmented reality tracking. It designs a prototype composed of iPhone and iPad devices and evaluates its contribution in two scenarios that current systems cannot handle. The results reveal the clear benefit of this approach for cultural heritage, allowing it to operate in situations when users look up in the sky to see the roof of virtual buildings, or when they move closer to a white wall to perceive details of a virtual painting. Finally, the paper discusses the system's limitations and proposes solutions to them.

▪ **A Comparative Analysis of Different Software Packages for 3D Modelling of Complex Geometries (Project Paper)**

Styliani Verykokou et al.

Abstract:

The purpose of this paper is the investigation of the performance of four well-established commercial and open-source software packages for automated image-based 3D reconstruction of complex cultural and natural heritage sites, i.e., Agisoft Metashape, RealityCapture, MicMac and Meshroom. The case study is part of the inaccessible giant rock of St. Modestos, in the archaeological site of Meteora. In terms of computational time, the commercial software packages were the most time-efficient solutions, with Metashape being the fastest. They also have a friendlier user interfaces, which makes them adoptable even by non-photogrammetrists. All four solutions yielded approximately comparable results in terms of accuracy and may be used for the generation of 3D dense point clouds of complex sites. With the exception of Meshroom, they may produce georeferenced results. Also, with the exception of MicMac, which did not yield satisfactory results in terms of textured mesh, they may be used for generating photorealistic 3D models. The comparative analysis of the results achieved by the tested software will serve as the basis for establishing photogrammetric pipelines that may be generally used for 3D reconstruction of complex geometries.

■ **Robotic fabrication in conservation: digital workflows and skills evaluation (Project Paper)**

Sara Codarin et al.

Abstract:

The paper describes a laboratory experiment carried out at Lawrence Technological University – College of Architecture and Design (MI-USA). The project starts from the premise that the ubiquity of digital technologies within the framework of the Fourth Industrial Revolution has an important potential for the conservation of Cultural Heritage. The enhancement of digital resources, the possibility to access data simulation, and the availability of new construction tools such as robots, will allow restoration to be based on digital data. In the current technological ecosystem, Cultural Heritage can benefit from digital data collection but also from digital fabrication, to achieve both digital and tangible conservation. The experiment has the ambition to simulate an on-site robotic fabrication processes by imagining the integration of machines in the conservation building site. An industrial robot was used to operate within vertical and horizontal constraints on irregular surfaces, to fabricate a wall gap as a proof of concept. An abandoned church in Detroit downtown was used as a test-bed, from the research process a methodological workflow emerges.

■ **Towards a Building Information Modeling system for identification and retrofit planning of stone damages (Project Paper)**

Klaus Luig et al.

Abstract:

Nowadays building works, especially of historic buildings with facades out of natural stone, require continuous maintenance, repair and retrofit works. In order to fulfil the needs for a completely digitized natural stone retrofit process, works are to be projected, planned, conducted and cleared with instrumentation of Building Information Modeling (BIM). Due to this need, a novel knowledge-based stone damage identification system focused on natural stone damage on the basis of BIM is developed, which will present implicitly existing knowledge and information from the building survey explicitly and objectively by using semantic data structures. BIM-SIS is an adaptive damage identification system for natural stone, which allows to virtually merge different natural stone damages, recorded by different information systems and with different procedures, into a holistic damage model. This model is used to assess the damages integrative and in detail, supported by knowledge-based methods, and to develop a uniform and cost-stable remediation strategy. Therefore, the BIM-SIS methodology consists of BIMification for information processes, Ontologies for knowledge representation and Multimodels for data interoperability. These formed continuous interoperable digital construction representation consists of separate but interlinked domain models. This model structure is then extended for remediation execution management and allows to simply incorporate subsequently detected defects during execution. The complete damage profile is the basis for all further retrofitted creation and calculation processes in BIM-SIS which will automatically lead to user customized retrofit variants presented in VR and AR.

Preservation and Use and Re-use

e-Libraries and e-Archives in Cultural Heritage

▪ **PAGODE – Europeana China (Project Paper)**

Valentina Bachi et al.

Abstract:

PAGODE is a new project (start date 1 April 2020), which proposes a thematic approach to the aggregation, curation and presentation of Chinese cultural content hosted in European museums and Cultural Heritage Institutions (CHIs). The focus of the project is to offer an innovative experience by making this content available in Europeana, the European digital library. PAGODE will aggregate more than 10,000 new digital objects, annotate and enrich more than 2,000 digital objects that are already in Europeana, and activate a wide range of CHIs to plan new digitization and curation methods for relevant content from their collections. Focusing on the various forms of the presence of Chinese culture in Europe, the overall aim of PAGODE is to add further value to CHIs that own Chinese collections, to reach new end users, and to encourage the creative reuse of cultural content in the domains of multicultural integration, cultural tourism, education and research.

▪ **On the Digital Road: A Case of Stecci (Project Paper)**

Meliha Handzic et al.

Abstract:

This paper explores the work done so far on creating and using digital data regarding stecci – UNESCO-listed world heritage from medieval Bosnia. Firstly, the paper reveals a slow, but steady progress towards creating a wholistic digital catalogue of all existing stecci necropolises and tombstones. Secondly, it discovers an encouraging trend of innovative research methods for analysing these digital data, as well as for production of digital art inspired by these important monuments. Finally, the paper identifies the main problem that hinders faster progress towards ‘digital stecci’ in the costly and somewhat piecemeal approach evidenced in individual endeavours of scholars, professionals and/or artists. More coordinated effort and teamwork is recommended as a way forward.

Virtual Museum Applications (e-Museums and e-Exhibitions)

■ **The Diary of Niels: Affective engagement through tangible interaction with museum artifacts (Project Paper)**

Mette Muxoll Schou et al.

Abstract:

This paper presents a research through design exploration using tangible interactions in order to seamlessly integrate technology in a historical house museum. The study addresses a longstanding concern in museum exhibition design that interactive technologies may distract from the artifacts on display. Through an iterative design process including user studies, a co-creation workshop with museum staff and several prototypes, we developed an interactive installation called The Diary of Niels that combines physical objects, RFID sensors and an elaborate fiction in order to facilitate increased visitor engagement. Insights from the research process and user tests indicate that the integration of technology and artifacts is meaningful and engaging for users, and helps to introduce museum visitors to the historic theme of the exhibition and the meaning of the artifacts. The study also points to continued challenges in integrating such hybrid experiences fully with the rest of the exhibition.

■ **Digital transformation strategy initiative in cultural heritage: The case of Tate Museum (Project Paper)**

Vassiliki Kamariotou et al.

Abstract:

Museums have now changed their intent and embraced a more "visitor-oriented" approach to provide this unforgettable experience for visitors. Digital museum strategy plays a decisive role in how museums want to use technology to promote innovation network growth, competitive advantage, and economic efficiency. However, it is worth noting that there are still significant gaps in technical equipment between museums. This paper draws on the Museum of the Tate and aims to examine its transformation from a conventional museum to a museum of the 21st century. The case of the Tate museum is of particular interest because of its obvious intention to be regarded as a leading museum in Europe, expressed in its current strategic planning policies. This paper also highlights some of the advantages and problems associated with this program and its future directions. This paper examines how the Tate has introduced technological systems to turn itself into a virtual museum and succeed in the global economy. This paper aims at examining and explaining a museum's transformation into a virtual museum. The findings of the case study show that the Tate museum has successfully applied the digital strategy with the goal of being a model for the world of virtual museums. This paper helps cultural practitioners draw more lessons from the proposed key drivers of digital museum strategies and reach conclusions on digital museum planning today.

■ **Time-Layered Gamic Interaction with a Virtual Museum Template (Project Paper)**

Erik Champion et al.

Abstract:

This paper discusses a simplified workflow and interactive learning opportunities for exporting map and location data using a free tool, Recogito into a Unity game environment with a simple virtual museum room template. The aim is to create simple interactive virtual museums for humanities scholars and students with a minimum of programming or gaming experience, while still allowing for interesting time-related tasks. The virtual environment template was created for the Oculus Quest and controllers but can be easily adapted to other head-mounted displays or run on a normal desktop computer. Although this is an experimental design, it is part of a project to increase the use of time-layered cultural data and related mapping technology by humanities researchers.

■ **Virtual Museum ‘Takeouts’ and DIY Exhibitions – Augmented Reality Apps for Scholarship, Citizen Science and Public Engagement (Project Paper)**

Sandra Woolley et al.

Abstract:

This paper presents an Augmented Reality (AR) project for the curation of virtual museum ‘takeouts’ and DIY exhibitions. The project’s outputs include novel AR app technology demonstrators, to support co-design with museum users and stakeholders - the goal being to create easy-to-use AR apps for scholars, citizen scientists and the interested public. The apps were designed for users to create, display, animate and interact with exhibitions of selected 3D artefacts that could, for example, reflect academic specialisms for sharing with fellow researchers or could be eclectic favourites from museum visits to show to friends or to use in school activities. The overarching project ambition, was to create AR apps to support research, engagement and education and to enable visualizations of individual artefacts as well as to assemble or reconstruct artefact forms. These forms are exemplified with 3D models of a cuneiform envelope and its tablet contents, viewable either as i) separate artefacts or ii) in their original enveloped form, with the AR apps enabling animated opening and ‘X-ray views’ of the contents within. In this way, the apps can enable users to visualize individual objects or reconstructions that can comprise artefacts held in different museums. This work is complemented by Euromed 2020 Android and iPhone AR app poster papers that account for the individual app developments, whilst this paper surveys the AR context, the design decisions and the wider project goals and ambitions.

■ **EPANASTASIS-1821: Designing an Immersive Virtual Museum for the Revival of Historical Events of the Greek Revolution (Project Paper)**

Georgia Georgiou et al.

Abstract:

Recent technological advances have greatly affected the museum practice, introducing new and innovative technological solutions for the creation of more interactive, multisensory and experiential museum exhibitions. Virtual reality applications allow museums’ visitors to be fully immersed in interactive adventures and consequently, many museums are focusing their digital strategy on that direction. Meanwhile, the use of serious games technology in

museum environments set new perspectives in the educational and the entertaining impact of museums' experiences. This contribution describes the principles and the guidelines that defined the digital museological design process of the Virtual Museum EPANASTASIS -1821, the development of which is based on the technologies of virtual reality and serious games. The paper indicates how the use of virtual reality and serious games in exhibition design can strengthen designers' creativity, enhance the interpretation dynamic of the exhibition and the memorization potential and lastly, create memorable museum experiences.

▪ **Virtual museums and Human-VR- Computer Interaction for Cultural Heritage Application: new levels of interactivity and knowledge of digital models and descriptive geometry (Project Paper)**

Fabrizio Banfi et al.

Abstract:

Open and advanced real-time 3D creation tools are continuously evolving, offering new cutting edge solutions to support the creation of immersive virtual experience-oriented to different purposes, devices and users. In recent years, different Virtual and Augmented reality (VR-AR) projects have clearly shown how 3D modeling and Building Information Modeling (BIM) can be the proper bases to enhance the new paradigm of interactivity of 3D in-formative systems, moving from static models to virtual objects able to interact with the user's input in the 3D digital environment. For those reasons, this study proposes a method able to give life to 3D survey data transforming static models in informative objects and experience able to enhance the virtual-visual storytelling (VVS) of heritage buildings. Thanks to scan-to-BIM projects and BIM interoperability tests based on the values of scientific drawing, descriptive geometric, measurements, historic documentation and digital proxemic have been possible to achieve new levels of communication, knowledge and human-VR-computer interaction, favoring documentation, education and learning of different type of scenarios, spaces and heritage buildings.

Visualisation Techniques (desktop, Virtual and Augmented Reality)

▪ **COSMOS. Cultural Osmosis - Mythology & Art. A data organization and visualization platform, with the use of AI algorithms. (Project Paper)**

Stelios Thomopoulos et al.

Abstract:

The richness of Greek mythology, combined with the need to preserve and spread the intangible and tangible cultural heritage, constitute the incentives towards the exploration of new ways to narrate these fascinating "stories" and to display their artistic depictions. COSMOS offers the opportunity to record Greek mythology, both in its written and visual forms. COSMOS is developed in two interrelated units, Myths and Art. Each one is organized in three dynamic windows, that visualize the correlations among their basic elements, thus offering a complete picture to the user. Myths include: a) the myths as stories, b) the participating characters and c) the places these stories are set in, whereas Art includes: a) the portrayals of myths in artworks, b) the depicted characters and c) their original and present location. The implementation is realized by the Knowledge Management System and the Knowledge Presentation System, that make use of state-of-the-art technologies in the fields of Machine Learning, Natural Language Processing

and 3D Imaging, in order to visualize myths, works of art and their connections, in an appealing and comprehensible way. The final product is aimed towards a vast audience and it can be used: a) as a study aid for anyone interested, b) for educational purposes, by teachers and students, c) as a reference tool in the field of the Social Sciences and the Humanities, for the production of research projects, and d) as a scientific documentation tool, for exhibition curating purposes.

Storytelling and authoring Tools

■ **Learning About the Heritage of Tinian Marble Crafts with a Location-Based Mobile Game and Tour App (Project Paper)**

Panayiotis Koutsabasis et al.

Abstract:

The paper presents a mobile location-based app that promotes learning and sensitization about the Tinian marble craftsmanship, which is enlisted to the Representative List of the Intangible Cultural Heritage of Humanity of UNESCO. It consists of a location-based game and a tour that provide semantic connections to visitors of the museum of Marble Crafts and the settlement of Pyrgos, Tinos island, Greece. The paper presents the game design which emphasizes exploratory learning and storytelling. Furthermore, an evaluation of the game has been conducted with playtesting at the field, with the participation of ten expert users: interaction and game designers, technology developers and cultural heritage professionals.

■ **“Narration”: Integrated system for management and curation of digital content and production of personalized and collaborative narratives (Project Paper)**

Stelios C.A. Thomopoulos et al.

Abstract:

The objective of this paper is to illustrate the common social need for Protection, Conservation and Preservation of Cultural Heritage (CH), through innovative and interactive process of curation and presentation of exhibits and events in places of cultural interest or remotely [1]. Through the project “Narration” we are demonstrating ways for specialized and non-specialized users to create and curate narrations of various extents based on the content available and share them with the general public. To this extent, the main focus can remain the research of adding an impact in providing a historical and Cultural significance by enhancing the understanding and appreciation of Cultural values. “Narration” proposes an innovative integrated platform for curating digital exhibitions and cultural content. Through a complex schema of interconnected narrative formations, “Narration” aims to contribute to a better understanding of the cultural and artistic relationships between exhibited objects and cultural heritage collections. Aiming at enhancing the preexisting apprehension on the way cultural heritage items carry valuable and explicable meanings, Narration suggests innovative and holistic curatorial solutions which enrich cultural heritage analysis and experience.

■ **Wandering in the labyrinth - Enhancing the accessibility to the Minoan past through a visitor-sourced approach (Project Paper)**

Therese Claeys et al.

Abstract:

Arising on the island of Crete around 2700 BC, the Minoans are traditionally regarded as the first advanced civilization on the European continent in its modern acceptance. Besides extrinsic natural and anthropic threats, this primordial heritage is also jeopardized by some of its own intrinsic properties. This paper aims to address three of these intrinsic hazards, namely the remoteness of Minoan sites, leading to their restricted physical access; their state of preservation, leading to their restricted intellectual access; and their complex, “labyrinthic”, architecture, coupling both types of accessibility limitations. The on-going research presented here intends to instrumentalize routes as a solution to these drawbacks: it seeks to demonstrate that routes may not only be used as a mobility vector to guide and control visitors’ movement but also, when context-aware, as an interpretation medium to improve on-site experience. Drawing upon phenomenological theories, this paper focuses, in particular, on the integration of the visitors’ interaction with their surroundings as an innovative approach in the design of those well-informed paths. Based on the outcome of an original experiment conducted among 73 participants on the archaeological site of Malia, this study explores the possibilities of a combined qualitative and quantitative analysis of the visitors’ movement in informing recommendations to increase the visitors’ understanding and orientation abilities on site. The visitor-based approach discussed in this paper is only one of the three axes to be combined in the general workflow, which advocates for the formalization of curated visiting paths on Minoan archaeological sites.

■ **THE REACH PROJECT CONTRIBUTION TO PROTECTING, PRESERVING AND VALUING TANGIBLE AND INTANGIBLE HERITAGE THROUGH PARTICIPATION (Project Paper)**

Nicola Alfarano et al.

Abstract:

This paper aims to demonstrate how social participation in culture contributes fostering the resilience of tangible and intangible heritage, and to enhance its preservation and conservation. The REACH Social Platform brings together a wide community of relevant heritage stakeholders’ representatives. They include research communities, heritage practitioners from public and private cultural institutions and organisations as well as policy-makers at European, national, regional and local levels. Based on a focused, critical mapping of existing research and practice, the objective of the Social Platform is to develop a better understanding of the challenges and opportunities for research and innovation in the participatory preservation, (re-)use and management of cultural heritage. The project identifies theoretical participatory models and tests them in practice through four thematic pilots. Final aim of the Social Platform is to propose the adoption of an integrated model of resilient European cultural heritage milieux.

Tools for Education

▪ **Virtual Heritage Learning Environments (Project Paper)**

Eimear Meegan et al.

Abstract:

The change and restrictions in how we interact with cultural heritage because of the COVID-19 pandemic has created an urgency in advancing remote and digital access to objects and sites. This paper outlines the process for developing Virtual Learning Environments (VLEs) using digital recording and modelling of architectural heritage and archaeology. Virtual Reality (VR) software, game engine platforms and WEB platforms are outlined which can be applied to represent heritage sites in addition to emerging screen based technological learning systems. The application Historic Building Information Modelling (HBIM) and Game Engine Platforms for creating Virtual Learning Environments (VLEs) is also examined. The design-theory based on Virtual Learning Objects for cultural heritage is explored. Two case studies are explored for their potential to create Virtual Heritage Learning Environments. Finally, a design framework is proposed for developing Virtual Heritage Learning Environments.

▪ **Ex Machina: An Interactive Museum Kit for supporting educational processes in Industrial Heritage Museums (Project Paper)**

Athina Bosta et al.

Abstract:

The aim of our project was to create an interactive museum kit in order to prepare young elementary students for their visit the Industrial Heritage Museum of Hermoupolis, enhancing their experience and promoting a “hands-on” learning approach. This paper presents field research, design decisions and the evaluation of the Ex Machina Museum Kit. The system comprises of 4 tangible team games, 4 documentary style videos presenting information relative to the theme of the museum’s collections as well as an interactive storytelling and decision-making game. Finally, a preliminary evaluation presents the benefits that this project would provide to the elementary school students visiting the museum.

▪ **Creative Industries and Immersive Technologies for Training, Understanding and Communication in Cultural Heritage (Project Paper)**

Eleftherios Anastasovitis et al.

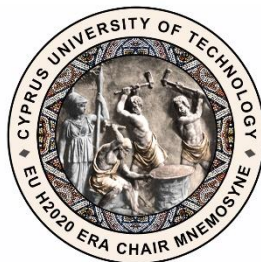
Abstract:

Creative industries, such as cinematography and videogames, have invaded in everyday life, offering fun and entertainment. The progress of immersive technologies provides breathtaking experiences to the users of creative digital productions. Through virtual reality the player can interact with the elements of the virtual world in a physical way. The conversion of games into serious, transformed them into innovative educational tools, for training in every

scientific field. Cultural Heritage is an inexhaustible source of inspiration that feeds ideas, scenarios, and stories into the creative industries. Moreover, the needs for the training of Cultural Heritage professionals and scientists, offer very interesting scenarios that can be implemented by the combination of serious games and virtual reality, under the prism of Life-long Learning. In this paper, the significant effect of three-dimensional animation, full-immersive serious games, and virtual reality for better understanding, communication, and training in Cultural Heritage is being presented. Three use cases that creative industry and immersive technologies apply on tangible and intangible Cultural Heritage, highlight the importance of multidisciplinary collaborations. In this context, the transformation of historical references into a meaningful three-dimensional video animation production and the design of a full-immersive serious game in VR is the first example. The emblematic Antikythera Mechanism, consists the second use case that led our research team in the creation of the innovative Virtual Museum of the ancient technological achievement. Finally, the design and the execution of Lifelong educational programmes for training in CH through creative industries and immersive technologies is the third use case.

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