Biannual Conference

Programme
Euromed 2016

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

CYPRUS UNIVERSITY OF TECHNOLOGY
DIGITAL HERITAGE RESEARCH LAB

Nicosia, Cyprus
Oct 31st - Nov 5th 2016
www.euromed2016.eu

REPATRIATION OF TWO LARGE-SIZE ICONS FROM SWITZERLAND ON MARCH, 30th 2016

The first one of the two repatriated icons illustrates Jesus Christ on a throne together with Saint John the Baptist, while the second one illustrates Enthroned Virgin Mary with Child together with Saint John the Evangelist. The icons are dated 1620 A.D. and were painted by the painter Meletios from Crete. These icons were stolen from the iconstasis of the chapel of Saint Jacob in Trikomo (Famagusta district) after the Turkish invasion of 1974. Saint Jacob's chapel had no frescoes but it was decorated with colorful plates of traditional folk art. Nowadays this chapel is illegally being used by the so called Turkish Authorities of Northern Cyprus as a Tourist Office.

The icon illustrating Jesus Christ and Saint John the Baptist has a size of 110 X 128 cm. and close to the feet of the latter there is the inscription «ΧΕΙΡ ΜΕΛΕΤΙΟΥ ΤΟΥ ΚΡΙΤΟΣ ΑΧΚ(=1620) Χ(ριστο) Υ». «Μ(ηνος) αυγούστου), which includes the name of the painter as well as the date. The icon of Mary, Mother of Jesus together with Saint John the Evangelist has a size of 114 X 134 cm. Both of them were in the possession of the Russian-jewish art dealer Alexander Kocinski, until their confiscation by the Swiss Police in Zurich in 2007. The only documentation to recover these stolen icons from abroad was was a paper published in the Proceedings of the International Cretan Conference in 1976 by the former director of Department of Antiquities of Cyprus, Mr. Athanasios Papageorgiou.

The icons were tracked down in 2007 in the Christie's Auction House in London, from where they were withdrawn after Kykkos Monastery's actions. Following the information of Kykko's Bishop, representatives of Kykkos Monastery traveled to Zurich in order to meet the owner of the icons, however it was not possible to talk him into returning the icons to the lawful owners. For this reason the Authorities of Cyprus were informed. The written complaint of the Byzantinologist of the Kykkos Monastery, Dr. Ch. Chotzakoglou, to the Cypriot Police and to Interpol-Cyprus initiated the repatriation procedure of the icons, leading eventually to their confiscation by the Swiss Interpol.

By means of a new testimony from Dr. Ch. Chotzakoglou in addition to a full documentation of the Cypriot origin of the icons and their looting after the Turkish invasion in northern Cyprus, the Supreme Court of Famagusta, based in Larnaca, took legal measures against the owner of the icons, who was convicted. The verdict of the Cypriot Supreme Court was afterwards used in the Swiss Court, leading to the signing of a compromise settlement between the Church of Cyprus and Kocinski for the return of the icons to Cyprus.

Dr. Ioannis A. Eliades,
Director,
Byzantine Museum and Art Galleries,
Archbishop Makarios III Foundation,
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EuroMed2016 Agenda - www.euromed2016.eu

	MONDAY 31/10/2016	TUESDAY 01/11/2016	WEDNESDAY 02/11/2016	THURSDAY 03/11/2016	FRIDAY 04/11/2016	SATURDAY 05/11/2016
8:30	REGISTRATIONS	REGISTRATIONS	REGISTRATIONS ALL the meetings will start at 9:00am and the EXCURSION at 9:30am	**Keynote speaker:** **Mrs. Rosella Caffo** Digital Museums: The State of the Art and the Future Perspectives	REGISTRATIONS	REGISTRATIONS
9:00-10:30	**Opening Ceremony and EuroMed2016 Best Paper Awards** **Keynote speakers:** **Prof. Dr. Antonia Moropoulou** Study, implementation and monitoring: Scientific integrated governance for the rehabilitation of the Holy Aedicule of the Holy Sepulchre in Jerusalem. **Prof.Dr. Dieter Fellner** Digitization – Use – Restoration in 3D: Challenges and Open Issues	**Keynote speaker:** **Prof. Dr. Wolfgang Kippes** On Monuments and Museums. From Reputation to Economic Driver - The role of Culture is moving **Keynote speaker:** **Mr. Axel Ermert** The Role of Terminology for Cultural Heritage EU - H2020 MSCA TERPSICHORE Project Meeting [invitation only] EU - H2020 INCEPTION Project Meetings [invitation only] **I. PROJECT / SHORT Papers** From Data Acquisition to Metadata, Semantics and Ontologies in Cultural Heritage	Conference EXCURSION [Registration is mandatory] EU-FP7 PEOPLE ITN-DCH TRAINING ACTIVITY EU - H2020 INCEPTION Project Meetings [invitation only] Kickoff **H2020-ViMM Project** [invitation only]	**Keynote speaker:** **Prof. Dr. Sarah Whatley** Preserving the Intangible, Tools for Documenting and Sharing Folkloric Dance. **Keynote speaker:** **Mr. Vasco Fassina** CEN TC 346-Conservation of Cultural Heritage: Update after a 10 Year Period of Activity Advisory Board and Experts Meeting H2020-ViMM Project [invitation only] EU - H2020 INCEPTION Project Meetings [invitation only] COST Action TD1406 Stakeholders meeting EU FP7 I-Treasure Project meeting Kickoff EU DARIAH-ERIC CY **IV. FULL / PROJECT / SHORT Papers** 3D Reconstruction and Modelling	**Keynote speaker:** **Mr. Jean-Pierre Massué** A Euro-Med Initiative: Proposal to set up "Cultural Heritage Advisors for Civ Protection in Emergency Situations and Military Authorities in case of Conflicts Situation **Keynote speaker:** **Prof. Dr. Mustafa Erdik** Earthquake Protection of Museum Displays **VII. FULL / PROJECT / SHORT Papers** Digital Cultural Heritage in Education, Learning and Training **FULL / PROJECT / SHORT Papers** Intangible Heritage Digital Documentation **JOINT WORKSHOP BETWEEN DARIAH-CY, i-TREASURES, DARIAH-MT, H2020-TERPSICHORE, 4D-CH-WORLD, ITN-DCH AND EUROPEANA-SPACE ON THE E-DOCUMENTATION OF EUROPEAN INTANGIBLE HERITAGE** The e-Documentation of European Intangible Heritage. A challenge for the Open Digital Humanities	**Keynote speaker:** **Prof. Dr. Gunnar Liestøl** Beyond Pokémon GO. Storytelling Mobile Augmented Reality and Cultural Heritage **IX. FULL / PROJECT / SHORT Papers** Non Destructive Techniques and Digital Applications for Materials' Preservation and Conservation in Cultural Heritage"
10:30 - 11:00	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
11:00 - 13:00	**FORUM PANEL** Erasing History and the Role of Documentation in Tracking and Proving Ownership of Looted Cultural Property **Chairwoman: Eleanor Fink**	EU - H2020 MSCA TERPSICHORE Project Meeting [invitation only] EU - H2020 INCEPTION Project Meetings [invitation only] **I. PROJECT / SHORT Papers** From Data Acquisition to Metadata, Semantics and Ontologies in Cultural Heritage	Kickoff H2020-ViMM Project [invitation only]	Advisory Board and Experts Meeting H2020-ViMM Project [invitation only] COST Action TD1406 Management meeting EU FP7 I-Treasure Project meeting Kickoff EU DARIAH-ERIC CY **IV. FULL / PROJECT / SHORT Papers** 3D Reconstruction and Modelling	**VII. FULL / PROJECT / SHORT Papers** Digital Cultural Heritage in Education, Learning and Training **JOINT WORKSHOP BETWEEN DARIAH-CY, i-TREASURES, DARIAH-MT, H2020-TERPSICHORE, 4D-CH-WORLD, ITN-DCH AND EUROPEANA-SPACE ON THE E-DOCUMENTATION OF EUROPEAN INTANGIBLE HERITAGE** The e-Documentation of European Intangible Heritage. A challenge for the Open Digital Humanities	**IX. FULL / PROJECT / SHORT Papers** Non Destructive Techniques and Digital Applications for Materials' Preservation and Conservation in Cultural Heritage"
13:00 - 14:00	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
14:00 - 15:30	**FORUM PANEL** Re-Thinking Management and Valorization of Middle East Cultural Heritage in the Post-War period: Where Disasters Turns to Opportunity, Development and Growth **Chairman: Georgios G. Giannoulis**	EU - FP7 IAPP Project Meeting [invitation only] EU - H2020 INCEPTION Project Meetings [invitation only] **II. FULL / PROJECT / SHORT Papers** Innovative methods on Risk Assessment Monitoring and Protection of Cultural Heritage	EU H2020 ATHENA Meeting Kickoff H2020-ViMM Project [invitation only]	Advisory Board and Experts Meeting H2020-ViMM Project [invitation only] COST Action TD1406 Management meeting EU FP7 I-Treasure Project meeting **V. PROJECT / SHORT Papers** Novel Approaches to Landscapes in Cultural Heritage	**VIII. FULL / PROJECT / SHORT Papers** Visualisation, VR and AR and Serious Games **JOINT WORKSHOP BETWEEN DARIAH-CY, i-TREASURES, DARIAH-MT, H2020-TERPSICHORE, 4D-CH-WORLD, ITN-DCH AND EUROPEANA-SPACE ON THE E-DOCUMENTATION OF EUROPEAN INTANGIBLE HERITAGE** The e-Documentation of European Intangible Heritage. A challenge for the Open Digital Humanities	**CLOSING CEREMONY**
15:30 - 16:00	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break	
16:00 - 18:30	16:00-17:00 EU H2020 INCEPTION PROJECT PANEL on 3D Semantics in CH **Chairman: Prof. Dr. Roberto Di Giulio** 17:00-18:30 EU PROJECT E-SPACE PANEL Europeana Sounds, EU ScreenXL, Europeana Fashion, Europeana Food & Drink, Photoconsortium, Energic-Od, Disruptive Media Learning Lab, Preforma **Chairwoman: Prof. Dr. Sarah Whatley**	Exhibitors Session EU - H2020 INCEPTION Project Meetings [invitation only] **SHARED MEETING with 18 EU PROJECTS: THE FUTURE of Digital Heritage in Europe** **A BRAINSTORMING & ROUNDTABLE DISCUSSION** [invitation only] **III. FULL / PROJECT / SHORT Papers** The New Era of Museums and Exhibitions-Digital Engagement and Dissemination	EU H2020 ATHENA Meeting Kickoff H2020-ViMM Project [invitation only]	Advisory Board and Experts Meeting H2020-ViMM Project [invitation only] **EU COST Action TD1406, 4D-CH-WORLD and EU H2020 INCEPTION joint Session** **VI. FULL / PROJECT Papers** Heritage Building Information Model (HBIM) **Chairs: Prof. João Martins, Prof. A. Doulamis and Prof. Roberto Di Giulio**	**JOINT WORKSHOPS** on Virtual Reality, Gamification and Cultural Heritage & The 3rd International Workshop on 3D Research Challenges in Cultural Heritage **JOINT WORKSHOP BETWEEN DARIAH-CY, i-TREASURES, DARIAH-MT, H2020-TERPSICHORE, 4D-CH-WORLD, ITN-DCH AND EUROPEANA-SPACE ON THE E-DOCUMENTATION OF EUROPEAN INTANGIBLE HERITAGE** The e-Documentation of European Intangible Heritage. A challenge for the Open Digital Humanities	
19:00	**FREE**	**SOCIAL DINNER**	**FREE**	**COST TD1406 Official Dinner**	**FREE**	

The EuroMed2016 Conference is in MEMORIAM of

Werner WEBER, Ewald QUAK and David ARNOLD

Werner Weber (15.09.2014 †) was responsible to the Federal Government Commissioner for Culture and the Media (BKM) in Bonn and in Berlin for all affairs related to Culture and Media on the EU level and actively worked as the BKM representative in several EU Committees in Brussels and in Luxemburg (such as the Member States Expert Group on Digitalisation and Digital Preservation - MSEG). He was one of the inventors of the EU Initiative for the Pan-European e-documentation of the 1st World War (Europeana Collections 1914-1918: http://www.europeana-collections-1914-1918.eu/) and of the European project for the documentation and preservation of the Fall of the Berlin Wall in 1989 (Europeana 1989 - http://www.europeana1989.eu/en/). Werner, was passionate and had an infectious personality that motivated others to join and work intensively in the area of Digital Heritage documentation. He was energetically involved in the planning and financing of Europeana (the biggest digital library in the world) and in the first stages for the creation of the German Digital Library, which is the leading aggregator for the Europeana (www.europeana.eu). We enjoy today Werner's diplomatic achievement with the digital Cultural Heritage Research in the H2020 Frame-work programme!
In October 2014 we announced to rename the EuroMed Best Paper Awards to be called the *Werner Weber Award* in honour of his contribution in the area of Cultural Heritage documentation.

H.E. the German Ambassador in Cyprus Mr. Nikolai von Schoepff, accompanied by Werner's family will handover the Best Paper Awards to the main Authors of the Scientific Papers.

Ewald Quak (29.04.2015 †) received his PhD from the University of Dortmund in 1985, and until 1987 worked as a researcher at the same time. He was a fellow of the Alexander von Humboldt Foundation and he worked as an academician and researcher in leading institutions in the USA, Norway, Germany and Estonia. During the last decades, he worked intensively in the area of Cybernetics, Computer Graphics and Digital Heritage. For more than 15 years he was Evaluator, Reviewer and Vice-Chair in the area of Engineering by the European Commission in Brussels.
He is one of the visionionaries of the Marie Curie Initial Training Network (ITN-DCH – www.itn-dch.eu), the only fellowship project in the World in the area of Digital Heritage) and he served as the Chair of the Advisory Board until he passed away. Ewald was the Co-Editor of the first Volume (published by Springer Verlag in 2015) of *3D Challenges in*

Cultural Heritage, about one of the most complicated areas of research in Cultural Informatics. Springer-Nature Verlag has agreed to continue this publication, which will be always dedicated to Ewald's memory. During EuroMed2016 we will present the second volume of this unique series of books.

H.E. the German Ambassador in Cyprus Mr. Nikolai von Schoepff, accompanied by Ewald's family will hand over the Digital Heritage Award for distinguish achievements to Prof. Dr. Dieter Fellner, Director of the Fraunhofer Gesselschaft / IGD in Darmstadt, Germany.

David Arnold (25.10.16 †) was involved for over 40 years in research into the design of interactive computer graphics systems and their application in architecture, engineering, cartography, scientific visualisation and over the past 18 years in Cultural Heritage. David was educated at the University of Cambridge and held an MA in Engineering and Computer Science and a PhD in Architecture. He subsequently spent 24 years at the University of East Anglia, Norwich, UK and 14 years at the University of Brighton where he was Dean of the Faculty of Management and Information Sciences and later the University's Director of Research Initiatives and Dean of the Brighton Doctoral College. Critically for the field of Digital Heritage, David was also the director of the university's Cultural Informatics Research Group which he founded in 2002. David was a pioneer and a real European in the area of the e-documentation of the Past.

Many Euromed conference attendees will be familiar with David as the Co-Chair of EuroMed2006 in Nicosia (the 1st EuroMed Conference - www.cipavast.org.cy), a Member of the Advisory Board in the EU FP7-PEOPLE Marie-Curie ITN-DCH Project (www.itn-dch.eu) and in H2020 CSA COOP8 ViMM Project (www.vi-mm.eu) and a co-coordinator of the EPOCH Network of Excellence under the EU's Framework 6 programme (FP6), involving 95 partners (http://epoch-net.org/). More recently he coordinated 3D-COFORM, a large scale Integrated Project under FP7. He was the founding Editor-in-Chief of the ACM Journal on Computing and Cultural Heritage and was a past Chair of the European Association for Computer Graphics.

To honour David's hard work, dedication and achievements, as of the next EuroMed conference in 2018 (the EU Year dedicated on Cultural Heritage) we will confer on the best PhD Fellowship, *the David's Arnold Digital Heritage achievement for PhD Students.*

Αἰωνία τους ἡ Μνήμη

TABLE OF CONTENTS

VENUES

- MAIN CONFERENCE VENUE

  FILIOXENIA CONFERENCE CENTER
  17 Thrakis Str., CY-1311 Nicosia, CYPRUS
  Show map
  Tel: +35722395000, Fax: +35722335653
  Monday, Tuesday, Wednesday, Friday, Saturday: 09.00 – 18.30 p.m.
  Thursday: 08.30 – 18.30 p.m.

- CONFERENCE REGISTRATION DESK

  Filoxenia Conference Center
  Every day: 08.30-18.30 p.m.

- COFFEE BREAK VENUE

  Filoxenia Conference Center
  Every day: 10.30-11.00 a.m. and 15.30-16.00 p.m.

- LUNCH VENUE

  Filoxenia Conference Center
  Pentadaktylos Restaurant
  Every day: 13.00 -14.00 p.m.

- SOCIAL DINNER VENUE

  Chateau Status Restaurant
  12 Markou Drakou str., CY-1102, Nicosia, CYPRUS
  (at the Ledra Palace Check Point in Nicosia) Show map
  Tuesday 01/11/2016 , 19.00 p.m.

CONFERENCE VENUE – LAYOUT

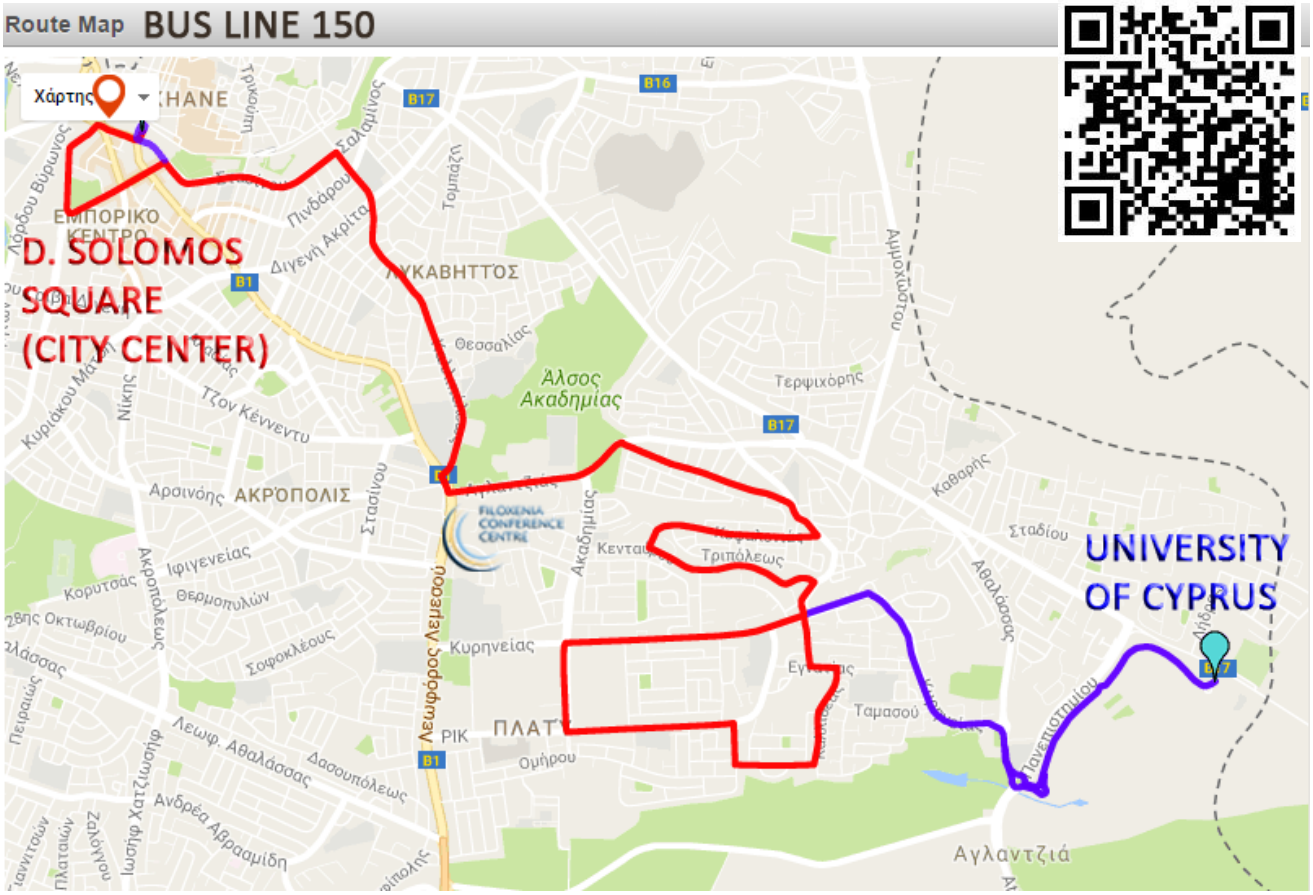
Zenon Kitievs (ZK)

FILOXENIA e-TOUR:

http://www.fcc.com.cy/venue

Source: http://www.fcc.com.cy/resource/gallery/category/1-meetings

FROM/ TO FILOXENIA CONFERENCE VENUE



Source: http://www.osel.com.cy/index.php?wp=routedetails_en&route=150

USEFUL LINKS

Please scan the QR code to find details about the following:

OFFICIAL WEBPAGE OF THE TWO AIRPORTS IN CYPRUS

BUS TRANSFER FROM THE AIRPORTS TO THE DIFFERENT CITIES IN CYPRUS (Bus Timetable from/to Larnaca | Kapnos Airport Shuttle Bus | Paphos Buses)

DOWNLOAD MAPS OF CYPRUS TOWNS (Nicosia | Limassol | Larnaca | Paphos | Famagusta)

OFFICIAL WEBPAGES OF: Cyprus Government | Ministry of Foreign Affairs | Press and Information Office | Cyprus Tourism Organisation | Aspects of Cyprus | Nicosia Municipality | Larnaca Municipality | Limassol Municipality | Paphos Municipality

SOCIAL DINNER VENUE

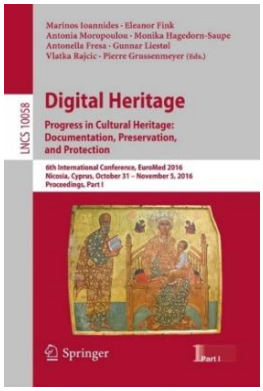
Chateau Status is a dreamily restaurant in the heart of the most historic area in the old town of Nicosia. This restored building along with the momentous Ledra Palace hotel, used to constitute for decades the only "bridge" between the occupied and free areas of Cyprus. Since the 50s, the surrounding area was infesting from bombings due to inter-communal fighting and later crossfires between the two sides until the middle 70s. The encircling buildings were evacuated, abandoned and devastated. The no-man's land between the two checkpoints, the so-called "Buffer Zone", became a symbol of conflict. From 1974 and onwards, that particular area was the meeting point for politicians and international observers to discuss the "Cyprus issue". Subsequently, the place became the venue where Cypriot citizens and civil society organizations were gathering either to prompt peace or assembling to pursue common projects or meeting people from other communities of Cyprus. Today, the place is breathing new life and the "green line", that was literally cutting in two the historical center, has been showcasing another part of the area's history; that of providing the means to explore its strong folkloric character where commercial and multi-cultural activities are combined to bring to the visitor a unique cultural experience.

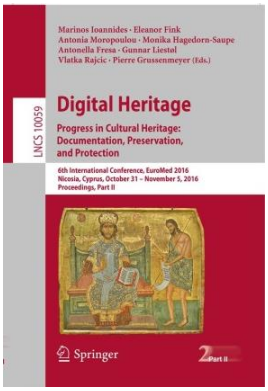
Sources:
http://www.home4cooperation.info/history-of-the-h4c
http://www.ledraproperties.com/en-gb/city/history/
http://www.heartcyprus.com/blog/ledra-palace-a-journey-through-time

Show photos

Source: TripAdvisor

PUBLICATIONS





Digital Heritage

Progress in Cultural Heritage: Documentation, Preservation, and Protection

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

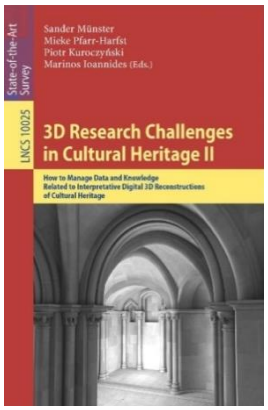
Ioannides, M., Fink, E., Moropoulou, A., Hagedorn-Saupe, M., Fresa, A., Liestøl, G., Rajcic, V., Grussenmeyer, P. (Eds.)

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.

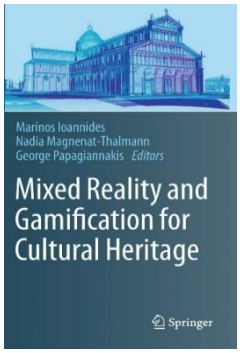
3D Research Challenges in Cultural Heritage II

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 not 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.

COMMITTEE

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Soile, Sofia	GR
Stork, Andre	DE
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Vosinakis, Spyros	GR
Walczak, Krzysztof	PL
Wallace, Manolis	GR
Wehr, Aloysius	DE
Wilk, Christian	DE
Yen, Alex Ya-Ning	TW

CONFERENCE EXCURSION

SOCIAL EXCURSION TO THE ASINOU CHURCH (11th CENTURY) UNESCO WORLD HERITAGE MONUMENT

Date: Wednesday 2nd November 2016, 09.30 a.m. - 18.30 p.m.

(Registration needed until November the 1st)

A full day excursion to the Asinou UNESCO WHL monument will be organized exclusively for the EuroMed2016 participants. Luxury fully insured air-conditioned buses will transfer the participants to the church, which is located 45km away from the Cypriot capital, Nicosia. There, the participants will be provided a tour about the history and the evolution of the church through time. The tour will be carried out by the fellows who are actively involved in the Marie Curie Initial Training Network for Digital Cultural Heritage (ITN-DCH www.itn-dch.eu) and have studied the Asinou monument as part of their research training. This presentation is considered to be part of the dissemination and outreach of their research results.

The church of Panagia Phorviotissa, or Panagia Asinou (Panagia is called in Greek the Mother of God), named after the nearest village that used to exist in the area, is located on the north foothills of one of the mountains that dominate Cyprus's inland center, Troodos mountain, on the east bank of a stream, three kilometers south of Nikitari village. According to the dedicatory inscription above its south entrance the church was initially erected between 1099 and 1105 CE by the magistrate Nikiphoros Ischyrios (donator) who, after his wife's death took a monastic vow and became a monk under the name Nikolaos. The church used to be the *katholicon* (monastery church) of the Monastery of Phorvion, which ceased its function in 1825 CE; the church is the only remain of the monastic building complex that has reached our times.

Architecture: The church consists of two parts: the vaulted single-aisled nave and the narthex, the latter one being a later addition belonging to the second half of the 12th century. The narthex with its two semi-circular apses and calotte belongs to a type directly influenced by Constantinople. Already from the 12th century a steep-pitched timber roof, covered with flat tiles, sheltered the church. The church has suffered great damages especially from earthquakes. Towards the end of the 13th century or at the beginning of the 14th century the conch of the apse collapsed and was soon after rebuilt and redecorated. At the same time the external buttresses were added and a little later, the flying buttress at the eastern end of the north wall was built.

Wall paintings: The church of Asinou has a vivid colorful interior, due to the frescoes depicting various scenes from the Orthodox Christian faith and is among the most cherished sites in Cyprus. It was painted immediately after the construction of the nave had been finished in 1105/6 CE expressing the latest style of the Comnenian period. These are the earliest original and most important mural paintings of the church, many of which are preserved in the apse of the Holy Bema (sanctuary) and the east and west wall of the church (initial layer of paintings), such as The Dormition of Virgin Mary, the Assumption and the Communion of the Apostles and Panagia Phorviotissa on the arch over the initial entrance to the church. They distinguish for their color, rhythm and harmony, the restrained expression and mobility of movement. Experts believe that they are of the few surviving frescoes that reflect the technique of Constantinople, thought to be the birthplace of the artist. The strong influence of the Empire's capital can be explained by the fact that the prevailing geopolitical conditions of the time led Alexios Comnenos (1081-1118 CE) to render Cyprus his most important military base of the north-eastern Mediterranean.

The narthex was also decorated with mural paintings soon after its erection during the second half of the 12th century, while it was redecorated in 1332/3 CE following strong Frankish influences. In this layer of iconographic programme of the 14th century a large number of donors can be distinguished, while under it only parts of the original beautification of the narthex (12th century) have survived and can be detected nowadays. Moreover, a mounted St. George painted in the 13th century on the narthex's south arch as a votive wall painting of a certain Nikiphoros Kallia, is most interesting and is part of a "portrait gallery" of the numerous donors. Also interesting is the wall painting of the Virgin Mary with Frankish donors on the semi-dome of the southern arch of the narthex, in which the female donor wears a long black veil, common amongst refugees from Syria to Cyprus mourning the fall of Acre in 1291.

Several wall paintings dating from the 17th century also survive in the church, including Christ Emmanuel (located in the sanctuary). All the aforementioned wall paintings of different periods in the church are the result of the various redecorations that have taken place throughout the lifetime of the monument and are considered to be some of the most important remains of the Byzantine painting.

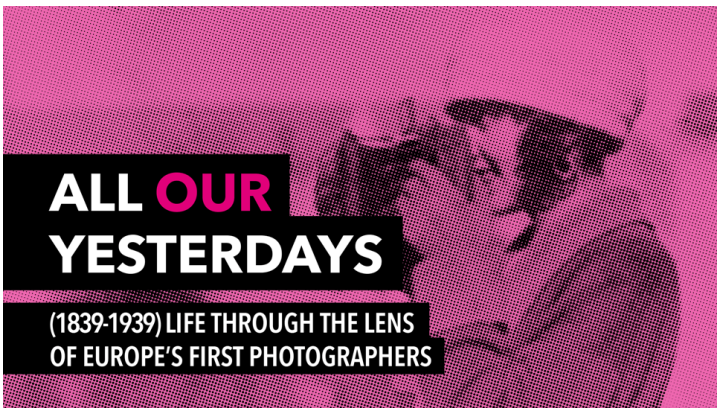
Since 1985 the Asinou church is declared as an **UNESCO World Heritage Site** and belongs to the Troodos Painted Churches group. These are the painted churches which up to this day have preserved brilliant examples of various trends of Byzantine and post-Byzantine monumental art, from the 11th to the 19th century. **(Virtual Representation of Monument)**. In particular, the Asinou church is visited by thirty thousand tourists per year, while many Cypriots still use the church in order to baptize their children. Accessibility through well-graded roads, picturesque setting in the foothills of the Troodos mountain and of course, the colorful interior of the monument make the Asinou church one of the top sightseeing of Cyprus.

The participants visiting Asinou will get the chance to be provided a tour which exceeds the typical "touristic" presentation of the tourist guides. Being scientists and prominent experts themselves, they will be provided with a scientific presentation of the state-of-the-art research activities that have been carried out by the ITN-DCH Marie Sklodowska-Curie fellows, thus acting as a real-life example of the implementation of multi-scientific and transdisciplinary approach to monument documentation and valorization of the acquired knowledge. Image-based modelling, 3D data acquisition techniques, digitizing methods and dissemination of the acquired knowledge are only some of the topics to be demonstrated based on a single case study: that of Asinou church.

ALL OUR YESTERDAYS, VIRTUAL EXHIBITION

Date: Monday 31st October – Saturday 5th November 2016, 09.00 a.m. - 19.00 p.m.

Don't miss the installation of "All Our Yesterdays" at the exhibition area.



This exhibition, featuring a kaleidoscope of early photographic masterpieces, selected by 18 museums, archives and photo agencies, showcases how the camera has, from the very beginning of photographic history, captured the world from its most beautiful angles as well as its most dramatic days. The original themes of the gallery represent eight main topics: The city lives | living the city; The art of portrait; Yesterday's children; Hardship and drama; The eye of beholder; Photographer at work!; Joy & leisure; A brave new world. All Our Yesterdays is an interactive and virtual exhibition that allows to access the images through a digital walk, moving across the different rooms. It is possible to move everywhere in the rooms, zoom the photographs, and learn more thanks to the descriptive panels**.** All Our Yesterdays has been also an exhibition on show in Italy (Pisa, April – May 2014), in Belgium (Leuven, February – March 2015) and in Denmark (Copenhagen, May – August 2015). The third edition in Denmark featured the participation of award winner photographer Mads Nissen. New exhibitions are in preparation for 2017, curated by PHOTOCONSORTIUM International Consortium for Photographic Heritage www.photoconsortium.net.

KEYNOTE SPEAKERS

Prof. Dr. Antonia Moropoulou

Antonia Moropoulou is currently Professor at the National Technical University of Athens, Greece and Vice President of the Technical Chamber of Greece. She is a Chemical Engineer, PhD, Full Professor at the Section of Materials Science and Engineering of the School of Chemical Engineering. She was elected as Contracted Professor in IUAV University of Venice (1993), Visiting Professor at Princeton University (1995-1996) and has served as Vice Rector of Academic Affairs of NTUA (2010-2014). She is a world class expert in building materials and the preservation of monuments that comprise the World's Cultural Heritage (Hagia Sophia in Istanbul, Medieval City of Rhodes, Holy Sepulchre in Jerusalem, et al.) scientific coordinator of more than 80 National, European and International research competitive programs and author of 1 book, 2 monographies, 16 chapters in books and more than 450 scientific publications. In 2012 she was awarded the 'YPATIA' Award by the 'Association of Hellenic Women Scientists'.

Presentation title: Study, implementation and monitoring: Scientific integrated governance for the rehabilitation of the Holy Aedicule of the Holy Sepulchre in Jerusalem.

Prof. Dr. Dieter Fellner

Since October 2006 Dieter Fellner is Professor of Computer Science at TU Darmstadt, Germany, and Director of the Fraunhofer Institute for Computer Graphics Research (IGD) at the same location. Previously he has held academic positions at the Graz University of Technology, Austria, the University of Technology in Braunschweig, Germany, the University of Bonn, Germany, the Memorial University of Newfoundland, Canada, and the University of Denver, Colorado. He is still affiliated with the Graz University of Technology where he chairs the Institute of Computer Graphics and Knowledge Visualization he founded in 2005. Fellner is also CEO of the Fraunhofer Austria Research GmbH since November 2008 and Board Member of the recently established Fraunhofer Project Centre for Interactive Digital Media at Nanyang Technological University (Fraunhofer IDM@NTU) in Singapore since June 2010.

After his studies of Technical Mathematics in Graz (Diploma 1981, Doctorate 1984, Habilitation 1988) his career started in the MUPID development team (1982), where he was responsible for the decoder-based videotex graphics editing system. Dieter Fellner's research activities over the last years covered algorithms and software architectures to integrate modeling and rendering, efficient rendering and visualization algorithms, generative and reconstructive modeling, virtual and augmented reality, graphical aspects of internet-based multimedia information systems and cultural heritage as well as digital libraries. In the latter

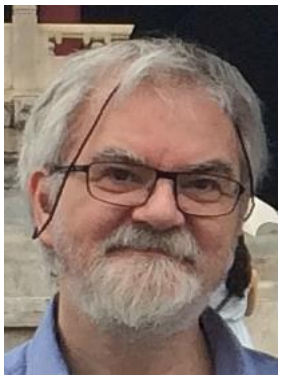
field he has coordinated a strategic initiative funded by the German Research Foundation (Deutsche Forschungsgemeinschaft) from 1997 till 2005. Among several other R&D activities he is currently coordinating a strategic initiative (DFG Leistungszentrum) addressing the challenges general documents pose on libraries and information repositories. These challenges fit well with his current main focus on Visual Computing, in the academic research context as well as within the applied R&D of Fraunhofer IGD.
He is a member of EUROGRAPHICS, ACM, IEEE Computer Society and the Gesellschaft für Informatik (GI) where he serves as a member of the Board of Directors (erweiterter Vorstand) as well as the chairman of the Graphics Chapter (Fachbereich Graphische Datenverarbeitung). Furthermore, D. Fellner is an advisor for the German Research Foundation (as a member of DFG's AWBI) and the European Commission (as a member of ISTAG).

Presentation title: Digitization – Use – Restoration in 3^{+}D: Challenges and Open Issues.

Prof. Dr. Wolfgang Kippes

A Civil Engineer from the Technical University of Vienna, who served as CEO for the Schloss Schönbrunn GmbH from 1992 until 2012 (UNESCO WHL Monument).
He was responsible for project development, restoration and conservation, research and development.
He has been involved in international Research and development programmes such as the COST C5, Indoor Climate Monitoring and Control (PREVENT), Fire protection in Historic Buildings (COST C17) and of the EU project Cultural Heritage Identity Card (CHIC). He served also as a member of the NFPA Cultural Resources Committee 2001 to 2012. Currently, he is a visiting Prof. at the University for Applied Arts Vienna and at the Donau-Universität Krems.

Presentation title: On monuments and museums. From reputation to economic driver - the role of culture is moving.



Mr. Axel Ermert

Studies: Sociology and Information Science in Berlin.
Beginning 1977, Axel has been working with DIN (German Standards Institute), in the department covering the information field (publishing, libraries, archives, museums, terminology, lexicography, printing), including work for the International Standards Organisation ISO as the Secretary of ISO/TC 46/SC 3 which finally produced “ISO 5127 Information and Documentation – Vocabulary (now 2016)” and ISO/TC46/WG2 “Country codes” (Standard ISO 3166 Parts 1, 2, 3). In this context, the first relation to the cultural heritage and museum field emerged in 1984/1987, particularly towards ICOM-CIDOC, and this relation has been kept ever since.

During the aforementioned work, Axel developed a growing interest in a comprehensive view of the information chain as a whole, researching into the interconnections within, as well as the commonalities of, the information field with so interrelated fields like archives, libraries, documentation, museums, lexicography / terminology, printing. As from 1999, he has been a staff member of the Institut für Museumsforschung (IfM) of the State Museums of Berlin (SMB-PK), Germany, a central research and documentation institute for museums in Germany.
Axel has been teaching sociology, documentation (information science) and aspects of museology at Applied Universities in Berlin, Germany, since many years.
2004-2010, Axel is a member of the ICOM-CIDOC Board.

Presentation title: The Role of Terminology for Cultural Heritage.

Prof. Dr. Sarah Whatley

Professor Sarah Whatley is Director of the Centre for Dance Research (C-DaRE) at Coventry University, UK. Her research interests extend to dance and new technologies, intangible cultural heritage, somatic dance practice and pedagogy, dance documentation, and inclusive dance practice; she has published widely on these themes. Funded by the AHRC, European Commission, Leverhulme Trust and Wellcome Trust, her current funded research projects focus on the creative reuse of digital cultural content, smart learning environments for dancers, reimagining dance archives and dance documentation, the generative potential of error in dance and HCI, dance and disability, and dancer imagery. She is also founding Editor of the Journal of Dance and Somatic Practices and sits on the Editorial Boards of several other Journals.

Presentation title: Preserving the intangible, tools for documenting and sharing folkloric dance.

Mrs. Rosella Caffo

Rossella Caffo was the director (2007-2015) of the Central Institute for the Union Catalogue of the Italian Libraries (ICCU) in Rome, an Institute of the Italian Ministry for Cultural Heritage and Activities and Tourism.
She coordinated major national digital cultural projects, for example CulturaItalia, the national cultural portal, the main Italian contributor to Europeana.
She was the coordinator of European projects such as MINERVA, MICHAEL, ATHENA, DC-net, INDICATE, DCH-RP, Linked Heritage and ATHENAPlus.
Since 2013 she is President of Michael Culture Association, an international association working in the domain of DCH and representing hundreds of cultural institutions. The Association is partner of DSI1 and DSI2 projects.

Presentation title: Digital museums: the state of the art and the future perspectives.

Mr. Vasco Fassina

He served the Italian Ministry of Cultural Heritage in the Venice Superintendence for 40 years as Senior researcher and Director of the Scientific Laboratory of Venice Superintendence with the responsibility to co-ordinate and promote interdisciplinary investigation projects aimed at conservation of historical building and wall paintings materials. He was involved for 25 years in International Training Programme for conservation of cultural heritage as teacher, coordinator and director of the biennial International Stone Conservation Course of UNESCO-ICCROM held in Venice.

Teaching activities at International level as Visiting Professor: in the Sino-Italy cooperation Project "Training in the Restoration and Conservation of the Chinese Cultural Heritage" in 2004 and 2007, in the International Course of University School of Monument Conservation in Rhodos, Crete, Ravello, for the Faculty of Architecture in Rosario (Argentina) and Salvador de Bahia (Brazil).

In 2004 he was appointed Chairman of CEN/TC 346, the European Committee for the standardization in the field of Conservation of Cultural Heritage.

In 2012 he has been appointed as Chairman of the national standardization commission for Cultural Heritage.

Actually is teaching chemistry applied to conservation and diagnostics techniques for investigation and conservation at Italian Universities and Academy of Fine Arts in Milano, Brescia, Napoli, Verona.

In 2007-2008 he was appointed by the General Direction for Cooperation and Development of the Italian Foreign Affairs Ministry to evaluate the feasibility study for the establishment of Longmen Stone Relics Conservation Center and of Dazu Stone Monuments Conservation Center respectively located in the Middle and in the South West of China.

Presentation title: CEN TC 346-Conservation of cultural heritage, update after a ten year period of activity.

Mr. Jean-Pierre Massué

16.03.1939: born, 19.12.2009: married

Education:

1963: Master at the University Centre of High European Studies, University of Strasbourg. Thesis: study of energy problems in Europe.

1964: PhD in Nuclear Physics, University of Strasbourg. Thesis: Absorption of negative Pi mesons at rest in light nuclei of nuclear emulsion with emission of nuclei of Li 8.

1970: PhD in physical sciences, University of Strasbourg, CERN (Geneva), Dubna (Russia), Berkeley: Lawrence Radiation laboratory (USA). Thesis: Contribution to the study of absorption and double charge exchange of Pi mesons on light nuclei.

Functions 1970 until 2015: Scientific Advisor of the Parliamentary Assembly of the Council of Europe,

Head of the Division Higher Education and Research, Executive Secretary of the Open Partial Agreement on Major Disasters: Council of Europe.

Member of the Senate of the European Academy of Sciences and Arts since 2009.

Present situation:

Membre du Sénat : Académie Européenne des Sciences et des Arts depuis 2009.

Member of the Senate of the European Academy of Sciences and Arts, since 2009.

Member of the COPRNM: "Conseil d'orientation pour la Prévention des Risques Naturels Majeurs" since 2010. Ministère de l'Écologie, du Développement durable et de l'Énergie: Paris.

Membre du Sénat et du Comité Exécutif de la Société Européenne des Sciences des Matériaux depuis 2013.

Member of the Senate and Executive Committee of the European Materials Research Society since 2013.

Past responsibilities:

Physicien Hautes Energies: CERN (Genève), Dubna: Centre Unifié des Recherches Nucléaires, Berkeley.

Conseiller Scientifique: Assemblée Parlementaire du Conseil de l' Europe,

Responsable de l' Enseignement Supérieur et de laRecherché: Conseil de l' Europe,

Secrétaire Exécutif Accord EUROPA Risques Majeurs: 2005

Presentation title: A Euro-Med initiative: Proposal to set up "Cultural Heritage Advisors for Civil Protection in emergency situations and Military Authorities in case of conflicts situation.

Prof. Dr. Mustafa Erdik

Mustafa Erdik is an emeritus Professor of Earthquake Engineering at Kandilli Observatory and Earthquake Research Institute in Bogazici University and also serves as the President of the Turkish Earthquake Foundation and as adjunct faculty members at Rose School in Pavia, Italy and at King Saud University in Riyadh, Saudi Arabia. He has received his BSc degree in Civil Engineering from METU in Ankara Turkey and his MSc and PhD degrees from Rice University in Houston, Texas, USA. He has worked with UN organizations and several international foundations around the world on earthquake engineering problems. He has authored and co-authored about 300 scientific publications including 5 books.

He currently serves as a member of the editorial board and as the editor-in-chief of several earthquake engineering related journals. In 1999 he was elected as the laureate of United Nation's Sasakawa Disaster Prevention Award, in 2004 he has received the NATO Science for Peace – Summit Prize, in 2013 he was awarded the Bruce Bolt Medal by SSA, EERI and COSMOS and in 2016 he was given the Prof. Nicholas Ambraseys Distinguished Lecture Award by the EAEE.

Presentation title: Earthquake Protection of Museum Displays.

Prof. Dr. Gunnar Liestøl

Gunnar Liestøl was born in 1957 in Norway and he is currently a Professor in the Department of Media and Communication at University of Oslo. He is the project leader of SITSIM, of 'INVENTIO (Theory and Practice of Designing Digital Genres for Learning and Leisure), of Genre Development for Digital Learning Arenas (2003-2006), and of Social and Cultural Transformations of the Internet 1-2. He has a great number of academic and professional publications in scientific Journals, Books and Conference Proceedings. He has a vast experience in Digital Media Design in collaboration with Museums and publishing houses: The Kon Tiki Museum, The Viking Ship Museum, The University Museum of National Antiquities, Gyldendal Norsk Forlag, The Voyager Company, Bertelsmann, Gionti, Norstedt Forlag, Midgard Historical Centre, Det norske instituttet i Athen, Det norske instituttet i Roma, Mission Dolores, Statsbygg/Nasjonalmuseet. Among his productions is the award–winning "Interactive Kon-Tiki", Gyldendal 1995. He produced the UNITE 2013 finalist Roman Forum sitsim app for iOS and Android. He was -and still is- a member in many academic conference and professional committees: Member of the Board of Centre for Research on Media Innovation, of Society of Norwegian Non-fiction Authors, Head of Studies/Vise Chair Dept. of Media and Communication of University of Oslo, Member of the board of LINO - Society for digital rights managements of Norwegian Authors (2003-2009). He was member in a numerous conference programme committees and supervisor/mentor in many Doctoral students.

Presentation title: Beyond Pokémon GO. Storytelling, Mobile Augmented Reality and Cultural Heritage.

PANEL DISCUSSION

▪ ERASING HISTORY AND THE ROLE OF DOCUMENTATION IN TRACKING AND PROVING OWNERSHIP OF LOOTED CULTURAL PROPERTY

Chairwoman: Eleanor Fink

Date: Monday 31st October 2016, 11.00-13.00 p.m.

"Murdering History" is the title of a rent article by James Harkin in Smithsonian Magazine. It focuses on the devastating cultural genocide being waged by ISIS and combatants in Syria's civil war. The idea of erasing or "murdering" history by destroying cultural heritage or evidence of our past is not new. For decades thieves have been robbing archaeological sites, churches, museums, and private collections. While there are no exact figures, it is a criminal industry estimated in the billions annually. History sadly is erased when robbers disturb an area and destroy evidence about the origins of objects. Thieves may chop off a head, cut a portion of a mosaic out of the wall of a church, cut a painting out of its frame, store stolen items in places that could cause further damage, or keep the items hidden so that they are never seen again (e.g., the thirteen works of art taken in 1990 from the Isabella Stewart Gardner Museum).

Documentation about objects is an essential and key component to finding lost or stolen cultural property and in establishing ownership in a court of law. This panel will explore what kind of documentation is needed to track cultural property and establish ownership. It will look particularly at trafficking from Syria and Iraq and talk about the obstacles for managing trafficking as well as how to establishes bridges and open more communication across key agencies.

Panel Organizer and Moderator: Eleanor E. Fink, manager and founder, American Art Collaborative Linked Open Data Initiative
Françoise Bortolotti, Criminal Intelligence Officer, Works of Art Unit, Interpol
France Desmarais, Director of Programmes and Partnerships, International Council of Museums (ICOM)
Prof. Dr. Markus Hilgert, Direktor, Vorderasiatisches Museum im Pergamonmuseum Staatliche Museen zu Berlin - Preußischer Kulturbesitz and Project Leader, ILLICID
Thomas R. Kline, Counsel, Andrews Kurth LLP
Maria P. Kouroupas, Director Cultural Heritage Center, US Department of State
M. Gavriilidis, Office for Cultural Heritage Property, Department of Criminal Investigation, Cyprus Police Headquarters

Moderator:

Eleanor E. Fink
Art and Technology Advisor

Eleanor E. Fink is an international art and technology consultant and philanthropy advisor. She has held senior positions at the Smithsonian, J. Paul Getty Trust, and World Bank. Currently she manages the

American Art Collaborative (AAC), a project comprised of 13 US museums interested in the benefits of Linked Open Data. The planning phase of the AAC is funded by the Andrew Mellon Foundation.

At the World Bank she served as the point person for relations with public and private foundations. During her tenure she established several international partnerships and helped launch a World Bank wide community foundation initiative that explores the concept of establishing indigenous foundations in developing countries. She also coordinated the establishment of the Development Gateway Foundation (www.dgfoundation.org) as a 501 c (3). The Foundation's core mission is to reduce poverty and support sustainable development through the use of information and communication technologies (ICT).

From 1986 to 1998 she was a program officer and then Director of the J. Paul Getty Trust's Information Institute (GII) where she led the development of information policies and standards needed to document, manage, and protect cultural property. The Getty Vocabularies are one of the products of her leadership. As Director, she positioned the Getty Information Institute around the concept of universal access to art and images and promoted the concept of "interworkability" within and across arts, humanities, and cultural heritage organizations.

She conceived and launched Object ID -- an internationally recognized information standard that helps protect and recover stolen art objects. Today, Object ID is used and endorsed by a wide group of organizations and agencies including the US State Department, US Military, UNESCO, ICOM, Interpol, and the Carabinieri. Also at the Getty, she established Los Angeles Culture Net --- a web based gateway to the arts across the greater Los Angeles area and American Strategy -a digital gateway to art collections across Federal agencies in Washington, DC.

Before joining the J. Paul Getty Trust, she was Chief of the Office of Research Support at the Smithsonian American Art Museum where she directed several research projects. She established SOS: Save Outdoor Sculpture, a highly successful national arts program that engages volunteers in recording historical and physical condition information about sculptures located in parks, towns, and cities throughout the United States.

Speakers:

France Desmarais
Director of Programmes and Partnerships, International Council of Museums (ICOM)

As the International Council of Museums' (ICOM) Director of Programmes and Partnerships, since 2010, France Desmarais develops the institution's strategic partnerships and leads the organisation's programmes department in all issues which concern it, specifically in the field of museum emergency preparedness and response, in ICOM's international fight against illicit traffic in cultural goods, as well as diverse tangible and intangible heritage related issues. Under her leadership and initiative, ICOM's Programmes Department created, in 2013, the International Observatory on Illicit Traffic in Cultural Goods (obs-traffic.museum).

In developing ICOM's programmes and actions to protect cultural heritage at risk, France works closely with different museums around the world, national governments and international organizations such as UNESCO, INTERPOL, UNODC, WCO, UNIDROIT. She is the permanent Secretary of ICOM's Disaster Relief Task Force for Museums and is administrator of the International Committee of the Blue Shield (ICBS).

Before joining ICOM, Ms. Desmarais had previously worked in museum management for over ten years, namely as Head of Strategic Initiatives for a museum in Montreal, Canada, where she is from. She also worked and lived in Central Africa and in the Middle East, teaching at the Faculty of Arts at the Lebanese University. France is now based in Paris, at ICOM's international headquarters.

Maria P. Kouroupas

Executive Director, Ambassador's Fund for Cultural Preservation and Director Cultural Heritage Center, US Department of State

Maria P. Kouroupas is the executive director of the Ambassador's Fund for Cultural Preservation. She attended the University of Arkansas and the State College of Arkansas, receiving a Master's Degree in History and Education. In 1977 she worked for the American Association of Museums in Washington D.C., and in 1984 she began at the United States Information Agency, where she became Deputy Director of the Cultural Preservation Advisory Committee. In 1993 she was named its director, and she also served as the executive director of the Committee before coming to The Cultural Heritage Center in that same capacity.

Françoise Bortolotti

Seconded to INTERPOL (ICPO), General Secretariat (Lyon, France), Sub-Directorate "Drugs and Organized Crime", Works of Art Unit

1993 – 2001: French Ministry of the Interior, Interior Intelligence Service, External Relations Department.

2001 – 2002: French Ministry of the Interior, Interior Intelligence Service, Communications Department (contact with local and regional press sector, liaison with various press organizations, printers and others, collaboration with polling organizations).

2002 – Dec. 2004: French Ministry of the Interior, General Directorate of the National Police, Office of European and International Affairs (preparation of multilateral meetings (G5 and G8) and Justice and Home Affairs councils of the European Union, monitoring of aspects of institutional and operational police cooperation within the European Union).

2005 – 2006: Prefecture of Ajaccio, Cabinet of the Deputy Prefect for Security in Corsica, Office of Coordination and Analysis (production of daily bulletins and information reports about law enforcement activities and political, social and legal issues on the island, management of statistical databases dealing with terrorism and criminal matters).

2006 – Dec. 2008: Embassy of France in Berlin (Germany), Deputy Police Attaché.

2010 – 2013: French Ministry of the Interior, Directorate of International Cooperation, Office of the Americas (8 months) and then Office of International Organizations (preparing for G8 Summit led by France, in particular the action plan aimed at strengthening transatlantic cooperation in the fight against drug trafficking (May 2011), monitoring of discussions and negotiations on security matters within international organizations (OSCE, ONUDC), specialized in monitoring progress in the Dublin Group (anti-drug efforts), coordinating and monitoring steps taken in West Africa as part of the informal Fontanot Group, monitoring of negotiations on European judicial directives conducted at the European level considering their impact on French police activity).

▪ RE-THINKING MANAGEMENT AND VALORIZATION OF MIDDLE EAST CULTURAL HERITAGE IN THE POST-WAR PERIOD: WHERE DISASTERS TURNS TO OPPORTUNITY, DEVELOPMENT AND GROWTH

Chairman: Georgios G. Giannoulis

Date: Monday 31st October 2016, 14.00-15.30 p.m.

The area including indicatively South Eastern Turkey, Iraq, Syria, Jordan, Lebanon, Israel, Egypt, Palestine, and Tunis hosts some of the most important historic remains of the human kind. It witnessed the passage of our first ancestors from Africa towards Asia and Europe. It was homeland to many great civilizations. It is also the birth place of the three major living monotheistic religions. Finally, during the modern era, it allowed contact between various European and North African populations and cultures, producing new architecture, cities, monuments, literature, music, and traditions. As a result, the Middle East hosts a unique palimpsest of tangible and intangible heritage of utmost importance for all the humanity.

This extensive region had already been severely ravaged by ferocious wars taking place in different countries during 4 decades. Yet, the situation has definitely been worsened in the last 5 years by the worst war conflict in the Mediterranean since World War - II, in Syria, the Iraqi wars, and the various conflicts surrounding them. The collapse of the states and their mechanisms of protection, along with the use of mass destruction weapons, have severely damaged the area's cultural heritage. The most prominent Syrian monuments have been transformed into a battle camp or even destroyed on purpose. These are only are just the tip of the iceberg: Palmyra, the old city of Aleppo, the ancient city of Damascus, Bosra, the Crac de Chevaliers, the Ancient Villages of Northern Syria just to mention the Unesco's listed World Heritage sites. In addition, thousands of local monuments, churches, monasteries, mosques, synagogues, museums have suffered damages, illegal excavations have been conducted, many objects have been looted and they already circulate in the international art market.

The Museums and cultural heritage sites have been particularly targeted[1], even outside of the area of the main conflict, due to their highly symbolic value and the attraction of tourists and international media. The network of archaeologists and state services protecting the antiquities has been also under great pressure. Valuable knowledge has been lost, by the disappearance of persons, scientists and the collapse of administrative structures. Similarly, the intangible heritage has suffered and is still suffering enormously. Ancient cultures and ethnicities, languages, traditions risk being lost forever. UNESCO, the international scientific community, as well as local scientists and archeologists have all repeatedly called for action to protect cultural heritage in the regions at war. UNESCO set up an observatory[2] and in collaboration with

[1] Milbry Polk and Anfgela Schuster, eds.The Looting of the Baghdad Museum: the Lost Legacy of Ancient Mesopotamia (2005), pp 214-216
[2] https://en.unesco.org/syrian-observatory/

Syrian and international experts has undertaken a coordination action aimed at the safeguarding of the Syrian cultural heritage[3].

Although these emergency measures are necessary and urgent in order to protect cultural heritage during the conflict, the most important challenge will emerge after the end of the war. The damaged antiquities and the collapsed public structures offer a pitiful spectacle; but at the same time they constitute a huge opportunity to re-think cultural heritage reconstruction, management, and valorization in a completely new way, using state-of-the-art approaches and techniques. Once the wars are over, the destruction suffered by cultural heritage and traditional management structures can become, hopefully sooner rather than later, a fertile field leading to new policies, in which modern knowledge and experiences are introduced and shared between stakeholders. The local, European and international community related to cultural heritage can contribute to change the landscape in this vast area in essential ways, transferring and exchanging experiences, methods, and technologies, in order to transform war disaster to opportunity, for the cultural heritage and regional development. The new policies could assist and support the Middle East societies, states and scientists to develop a modern CH management system, transforming the world class cultural heritage of the area into a source of national pride, transnational understanding and tolerance, into a local and sustainable economic development factor and a symbol of peace. Several scientific and policy-making areas are of utmost relevance, and they will serve as topics for the present session.
Therefore, we have called for papers concerning the transitional and the post-war period in Middle East, and presenting innovative approaches, examples and ideas related to:

- Tracking of objects and international preventive policies against illegal antiquities trade and recovery actions.
- Damage analysis of monuments. Processes of safeguard and recovery of relevant data for real/ virtual restoration processes.
- New digital technologies for the restoration, recovery, protection, valorization and accessibility of cultural heritage (digitalization, virtual reconstruction, multimodal access etc.) adapted to the needs of the post war period.
- Innovative ways of redesigning the architecture, human landscape and natural environment of the destroyed cities' that include the valorization of Cultural Heritage. - New approaches to site management and new museological, educational, financial and local development objectives including tourism.
- Cultural heritage preservation/restoration and national identities in the post-war period. Local communities' involvement, political and social awareness - National and international funding issues for cultural heritage in a post-war period.
- Intangible heritage damage and new recovery strategies - Reconstruction & human networks of scientists and stakeholders in the area: transfer of knowledge, experiences and training.
- Rebuilding and modernizing the human network and organizational structures of scientists, technicians and CH managers, in order to implement state-of-the-art approaches in the process of reconstruction, recovering and management of CH.

[3] 3. Syrian and international experts agree on emergency measures to safeguard Syria's heritage (4 June 2016) http://whc.unesco.org/en/news/1505

Each of the above issues opens a space for reflection and collaborative work, similar to the actions undertaken in Europe after World War II, yet with the knowledge, experience, resources and technologies of the 21st century. The results of this session are expected to serve as a future basis for national and international stakeholders (UNESCO, INTERPOL, ICOMOS, European Union, States, Universities, Research Centers, Foundations, donators etc.) in order to elaborate relevant policies and actions in the near future. Moreover, the conclusions will feed a debate about the necessity of organizing an International Conference on Middle East Cultural Heritage recovery, protection and valorization in the post war period as a driving engine for development, peace and growth.

▪ 3D SEMANTICS IN CULTURAL HERITAGE

Chairman: Prof. Dr. Roberto Di Giulio

inception
Inclusive Cultural Heritage in Europe through 3D semantic modelling

Date: Monday 31st October 2016, 16.00-17.00 p.m.

▪ REUSING DIGITAL CULTURAL HERITAGE: BOOSTING EDUCATION, AUDIENCE ENGAGEMENT, BUSINESS CREATION

Chairwoman: Prof. Dr. Sarah Whatley

E SPACE

Date: Monday 31st October 2016, 17.00-18.30 p.m.

AGENDA

17.00 – 17.10 Welcome and introduction by Chair prof. Sarah Whatley, Coventry University

17.10 – 17.20 PHOTOCONSORTIUM: capitalizing the experience of Europeana Photography

Antonella Fresa, PROMOTER (Italy)

17.20 – 17.30 The Disruptive Media Lab and the experience of Photomediations

Jonathan Shaw, COVENTRY UNIVERSITY (United Kingdom)

17.30 - 17.40 Europeana Sounds,

Sergiu Gordea, AIT Austrian Institute of Technology GmbH (Austria)

17.40 – 17.50 ENERGIC OD GeoPAN Atl@s APP: Open geo Data meet Built Heritage and Cultural Landscapes

Raffaella Brumana, Politecnico di Milano (Italy)

17.50 – 18.00 PREFORMA, Stefan Rohde-Enslin, Stiftung Preussischer Kulturbesitz (Germany)

18.00 – 18.10 The E-Space Portal, Vassilis Tzouvaras, National Technical University of Athens (Greece)

18.10 – 18.20 Europeana Food & Drink, Ch. Lazarou, (Cyprus)

18-20 – 18.30 Question and Answer, Discussion

Media Partner

DIGITAL MEETS CULTURE .net
www.digitalmeetsculture.net

EU PROJECTS

- EUROPEANA SPACE, BEST PRACTICE NETWORK – SPACES OF POSSIBILITY FOR THE CREATIVE RE-USE OF DIGITAL CULTURAL CONTENT

http://www.europeana-space.eu/

Digitization has been a major objective for most, if not all, cultural content holders in every European country. Museums, Libraries, Galleries, arts organisations and also private archives have completed significant digitization actions, also with the support of EU financing, so that now the amount of digitized cultural heritage in Europe is really impressive. Further progressing with digitization, which should be extended also to minor collections, archives and private citizens, requires us to understand how digital cultural data can be re-used in novel ways, in order to leverage on this wealth of digital resources to improve citizens' participation, access and enjoyment of cultural heritage and also to unlock the business potential that lies within it. This panel, organized by the Europeana Space project and involving the most notable EU projects and initiatives dealing with digitized cultural heritage, intends to showcase different approaches, examples and best practice of reuse for digital cultural data, and to assess their impact in terms of enlarging citizen participation, developing advanced tools and resources for educational purposes, and for creating new businesses and job opportunities. Relevant speakers from the key institutions in Europe, which are involved in the scenario of digital cultural heritage, will illustrate experiences of content reuse that exploit digital technologies to foster societal progress and also economic rewards. The panel is a great occasion for sharing knowledge and networking: cultural managers, ICT experts, researchers, creative industries, service providers and other EU projects are warmly invited to attend.

Europeana Space project has received funding from the European Union's ICT Policy Support Programme as part of the Competitiveness and Innovation Framework Programme, under GA n° 621037.

Together with "EUROPEANA SPACE", the following projects are also joining EUROMED 2016:

Photoconsortium: 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. www.photoconsortium.net

Europeana Fashion: International non-profitorganisation established after the conclusion of Europeana Fashion project in order to bring together and engage fashion institutions and creative industries in the valorisation and exploitation of fashion heritage online. http://www.europeanafashion.eu/

EU ScreenXL: this project includes organisations and archives who agreed to work to gether on providing access to their audiovisual materials sharing more than 40.000 videos, photographs and articles representing Europe's television heritage have been made available online through a freely accessible multilingual portal. http://www.euscreen.eu/

ENERGIC OD: ENERGIC OD applications and newly developed Virtual Hubs optimize the exploitation of geospatial Open Data for new marketable services of concrete use to the citizens and to stakeholders for more informed decision making. http://www.energic-od.eu/

Europeana Sounds: this is a Best Practice Network, focused on opening the gateway to Europe's sound and music heritage making it accessible online. http://www.europeanasounds.eu/

The Disruptive Media Learning Lab is a hybrid innovation practice and research unit. It instigates and supports open dialogues, promoting collaborative work and exploratory play for all interested in (re)defining the future of learning, and the university, in the age of disruptive media. http://dmll.org.uk/

PREFORMA: PREservation FORMATs for culture information/e-archives – is a Pre-Commercial Procurement (PCP) project co-funded by the European Commission, under its FP7-ICT Programme. The overall intention of the project is to research critical factors in the quality of standard implementation in order to establish a long-term sustainable ecosystem around developed tools with a variety of stakeholder groups

▪ INCLUSIVE CULTURAL HERITAGE IN EUROPE THROUGH 3D SEMANTIC MODELLING

http://www.inception-project.eu/

Realizing innovation in 3D modelling of cultural heritage through an inclusive approach for time-dynamic 3D reconstruction of artefacts, buildings, sites and social environments, INCEPTION enriches the European identity through the understanding of how European cultural heritage continuously evolves over long periods of time. INCEPTION methods and tools will result in 3D models that are easily accessible for all user groups and interoperable for use by different hardware and software. Towards that end, the development of an open-standard Semantic Web platform for Building Information Models in Cultural Heritage field to be further implemented in user-friendly Augmented Reality (VR and AR) operable on mobile devices constitutes project's primary objective. A special session of the INCEPTION project is planned for the starting day of EuroMed2016 (31st October), in which project's partners, aim, objectives as well as its current progress will be presented to conference's participants, while consortium's meeting will be held from 1st to 3rd of November. In the afternoon following the official closure of the meeting, the clustering between INCEPTION project and COST will be promoted.

INCEPTION project has received funding from the EU's H2020 Reflective Framework Programme for research and innovation under GA nº 665220.

▪ TERPSICHORE

http://www.terpsichore-project.eu/

TERPSICHORE aims to study, analyse, design, research, train, implement and validate an innovative framework for affordable digitization, modelling, archiving, e-preservation and presentation of ICH content related to folk dances, in a wide range of users (dance professionals, dance teachers, creative industries and general public). The project targets at integrating the latest innovative results of photogrammetry, computer vision, semantic technologies, time evolved modelling, combined with the story telling and folklore choreography. An important output of the project will be a Web based cultural server/viewer with the purpose to allow user's interaction, visualization, interface with existing cultural libraries (EUROPEANA) and enrichment functionalities to result in virtual surrogates and media application scenarios that release the potential economic impact of the ICH. The final product will support a set of services such as virtual/augmented reality, social media, interactive maps, presentation and learning of European Folk dances with tremendous impact on the European society, culture and tourism.

▪ **4D** - **C**ULTURAL **H**ERITAGE **W**ORLD

http://www.4d-ch-world.eu/

This project 4D-CH-World aims to analyze, design, research, develop and validate an innovative system integrating the latest advances in computer vision and learning, as well as, 3D modeling and virtual reality for the rapid and cost-effective 4D maps reconstruction in the wild for personal use, and support the aim of our European Commons and the digital libraries EUROPEANA and UNESCO Memory of the World (MoW) to build a sense of a shared European cultural history and identity. The main goal of the 4D-CH-World is to enable historians, architects, archaeologists, urban planners, or any other affiliated scientists to reconstruct from available data on repositories, study, understand, preserve or document urban environments, as well as, organizing collections of thousands of images (spatially and temporally) in generating novel views of historical scenes by interacting with the time-varying model itself. The evolving steps depiction helps understanding the cultural trends, performing behavioral analysis, exploiting the impact of the available raw resources in building development, further analyzing the urban economy factors, and simulating a future urban growth in order to understand the future demands, and satisfy in time the people's concrete needs. Education system will have the opportunity to exploit this innovative system to motivate students and help them better understand many things in an amusing way. Finally, pupils, university students, tourists, communes, future mechanics and economists, will observe urban environment changes through time, not just read it, and therefore understand it, so as, future plans of action, regarding urban renewal or sustainable development would be less likely to fail.

▪ INITIAL TRAINING NETWORK FOR DIGITAL CULTURAL HERITAGE

http:// www.itn-dch.eu/

The "Initial Training Network for Digital Cultural Heritage: Projecting our Past to the Future" (ITN-DCH) is the first and one of the largest Marie Sklodowska-Curie fellowship projects in the field of e-documentation/ e-preservation and CH protection. ITN-DCH aims –for the first time worldwide- to analyze, design, research, develop and validate an innovative multi-disciplinary and intersectoral research training framework that covers the entire lifecycle of digital CH research for a cost-effective preservation, documentation, protection and presentation of CH. Even though CH is an integral element of Europe, vital for the creation of a common European identity and one of the greatest assets for steering Europe's social, economic development and job creation, the current research training activities in CH are fragmented and mostly designed to be of a single-discipline, thus failing to cover the whole lifecycle of Digital Cultural Heritage (DCH) research which, by nature, has a multi-disciplinary and intersectoral agenda. ITN-DCH targets all aspects of CH ranging from tangible (books, newspapers, images, drawings, manuscripts, uniforms, maps, artefacts, archaeological sites, monuments) to intangible content (e.g. music, performing arts, folklore, theatrical performances) and their interrelationships. The project aims to boost the added value of CH assets by reusing them in real-application environments (protection of CH, evaluation, tourism, industry, advertising, fashion, films music, publishing, video games and TV) through research on (i) new personalized, interactive, mixed and augmented reality enabled e-services, (ii) new recommendations in data acquisition, (iii) new forms of representations (3D/4D) of both tangible/ intangible assets and (iv) interoperable metadata forms that allow easy data exchange and archiving.

▪ ViRTUAL MULTIMODAL MUSEUM

http:// www.vi-mm.eu/

ViMM was proposed in the Horizon 2020 Call Cult Coop8 for virtual museums and social platform on European digital heritage, memory, identity and cultural interaction. ViMM will develop and maintain a sustainable platform engaging a large number of key actors, stakeholders and communities of practices on how to improve the collaboration and comprehension among the entire community concerned with Virtual Museums (VM), in order to build up a common roadmap for future activities and explore how these new encounters can be evaluated to understand and define the models involved. The platform will be open to all practitioners and stakeholders wishing to contribute to decision making processes, agree on objectives and priorities, share experiences, policies and practices and will bring together public and private stakeholders in partnership. VM are necessary to support the accessibility, conservation, use and re-use of Cultural Heritage. The main focus of many VM at present is often profiled to technological novelties or down-sampled to existing linked web based collections or may even be just an extension of the museums website. In order to distinguish between key issues and to allow sufficient granularity and clarity of discussion, the work will be

divided between 5 broad Thematic Areas – the *'6 Ds': Definitions – Directions – Documentation – Dimensions – Demand – Discovery.* Each Thematic Area will be the responsibility of a Lead Partner who is a major actor on the European scene. Inevitable overlaps emerging between the Areas will be addressed through Action-wide coordination activities.

▪ EUROPEAN **CO**OPERATION IN **S**CIENCE AND **T**ECHNOLOGY - i2MHB ACTION (**I**NNOVATION IN **I**NTELLIGENT **M**ANAGEMENT OF **H**ERITAGE **B**UILDINGS)

http://www.cost.eu/, http://td1406.eu/

COST (European Cooperation in Science and Technology) is a pan-European intergovernmental framework. Its mission is to enable break-through scientific and technological developments leading to new concepts and products and thereby contribute to strengthening Europe's research and innovation capacities. i2MHB Action will create a pan-European open network, to promote synergies between Heritage Science's specialists, industrial stakeholders and research/education players, to achieve a unified common understanding and operation in the Heritage Buildings' (HB) domain, integrating multidisciplinary expertise, technology and know-how through a novel and independent global framework. HBs are undoubtedly an area where the multidisciplinary approach is essential, grounded on three major knowledge areas (pillars): 1) scientific wisdom, 2) systems and data, 3) social engagement. The i2HBM Action is structured in 5 Working Groups (WG): WG1: Common framework, WG2: Interoperability roadmap for HBs' sustainability, WG3: Integration of HBs into their surroundings, WG4: Social dimension of HBs, WG5: Coordination and deployment. The project's outcomes will provide an inflection point in the HBs' field, enabling global common practices usage and triggering global scale innovation and seamless operation, considering culture, place, technology and field of knowledge.

▪ **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.

- SHARING LOCAL CULTURAL HERITAGE ONLINE WITH **Lo**CAL COMPUTER-**CLOUD** SERVICES

http://www.locloud.eu/

LoCloud is a Best Practice Network of 31 partners with the overall goal to help small and medium-sized cultural institutions and organizations to upload their digitized material (over 4 million digital resources from european cultural institutions) into Europeana, the European digital library. Towards this cause of enhancing Europeana, LoCloud's work concerns the exploitation of the full potential of cloud computing technologies, the development of a cloud infrastructure (IaaS) and the creation of software services (SaaS) aimed to benefit content providers and users. A cloud-based technology infrastructure has enabled the aggregation of local content and a number of micro-services has helped to reduce technical, semantic and skills barriers and to render the content more discoverable and interoperable. Towards the cause of assisting small and medium-sized cultural institutions and organizations, LoCloud achieves that by: (i) supporting them in making their content and metadata available to Europeana, by using the cloud to provide services and tools which help to reduce technical, semantic and skills barriers, (ii) making available cloud-based software services which enable them to render their content more discoverable and interoperable, (iii) enabling smaller institution types such as house museums, which currently fall outside most aggregation infrastructures, to contribute their content to Europeana, (iv) exploring the potential of cloud computing for aggregation, enrichment and re-use, with a special focus on geographic location, (v) exploring and trial a cloud based architecture as a scalable platform for Europeana metadata aggregation and harvesting with higher efficiency and reduced maintenance costs, (vi) provide guidance, training and support facilities to serve the needs of content providers.

- i-TREASURES

http://i-treasures.eu/

In recent years, intangible cultural heritage has received international recognition and its safeguarding has become one of the priorities of international co-operation with UNESCO taking a leading role in this regard. The aim of this collaborative research project is to examine the role of new technologies in the safeguarding and transmission of expressions of intangible heritage using qualitative and quantitative research methods, by documenting key aspects of cultural expressions and enable their transmission through a participatory technology platform.

- 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.

SESSIONS

Monday 31/10

- 09:00 - 10:30 **Opening Ceremony and EuroMed2016 Best Paper Awards**
  Keynote speaker: Prof. Dr. Antonia Moropoulou
  Study, implementation and monitoring: Scientific integrated governance for the rehabilitation of the Holy Aedicule of the Holy Sepulchre in Jerusalem
  Keynote speaker: Prof. Dr. Dieter Fellner
  Digitization – Use – Restoration in 3^{+}D: Challenges and Open Issues
- 10:30 - 11:00 Coffee Break
- 11:00 - 13:00 **FORUM PANEL** on Erasing History and the Role of Documentation in Tracking and Proving Ownership of Looted Cultural Property
  Chairman: Eleanor Fink
- 13:00 - 14:00 Luncht
- 14:00 - 15:30 **FORUM PANEL** on Re-Thinking Management and Valorization of Middle East Cultural Heritage in the Post-War period: Where Disasters Turns to Opportunity, Development and Growth
  Chairman: Georgios G. Giannoulis
- 15:30 - 16:00 Coffee Break
- 16:00 - 17:00 **EU H2020 INCEPTION PROJECT PANEL** on 3D Semantics in Cultural Heritage
  Chairman: Prof. Dr. Roberto Di Giulio
- 17:00 - 18:30 **EU PROJECT E-SPACE PANEL** on Reusing Digital Cultural Heritage: Boosting Education, Audience Engagement, Business Creation
  Europeana Sounds, EU ScreenXL, Europeana Fashion, Europeana Food&Drink, Photoconsortium, Energic-Od, Disruptive Media Learning Lab, Preforma
  Chairwoman: Prof. Dr. Sarah Whatley
- 19:00 Free

Tuesday 1/11

- 09:00 - 10:00 **Keynote speaker: Prof. Dr. Wolfgang Kippes**
  On monuments and museums. From reputation to economic driver – the role of culture is moving
  Keynote speaker: Mr. Axel Ermert
  The Role of Terminology for Cultural Heritage
- 10:00 - 10:30 Project / Short Papers
  I. From Data Acquisition to Metadata, Semantics and Ontologies in Cultural Heritage
  Chairman: Matevz Domajnko
- 10:30 - 11:00 Coffee Break
- 11:00 - 13:00 Project / Short Papers
  I. From Data Acquisition to Metadata, Semantics and Ontologies in Cultural Heritage
  Chairman: Charalabos Ioannidis

- 13:00 - 14:00 Lunch
- 14:00 - 15:30 Full / Project / Short Papers
  II. Innovative methods on Risk Assessment, Monitoring and Protection of Cultural Heritage
  Chairman: Elias Nobilakis
- 15:30 - 16:00 Coffee Break
- 16:00 - 18:30 **EXHIBITORS SESSION**
  Full / Project / Short Papers
  III. The New Era of Museums and Exhibitions - Digital Engagement and Dissemination
  Chairwoman: Marleen de Kramer
- 19:00 Social Dinner

Wednesday 2/11

- 09:30 – 18:30 Conference Excursion EU-FP7 PEOPLE ITN-DCH TRAINING ACTIVITY **[mandatory registration]**

Thursday 3/11

- 08:30 - 10:00 **Keynote speaker: Mrs. Rosella Caffo**
  Digital museums: the state of the art and the future perspectives
  Keynote speaker: Prof. Dr. Sarah Whatley
  Preserving the intangible, tools for documenting and sharing folkloric dance
  Keynote speaker: Mr. Vasco Fassina
  CEN TC346-Conservation of cultural heritage, update after a ten year period of activity
- 10:00 - 10:30 Full / Project / Short Papers
  IV. 3D Reconstruction and Modelling
  Chairman: Diego Bellido Castañeda
- 10:30 - 11:00 Coffee Break
- 11:00 - 13:00 Full / Project / Short Papers
  IV. 3D Reconstruction and Modelling
  Chairman: Nicola Carboni
- 13:00 - 14:00 Lunch
- 14:00 - 15:30 Project / Short Papers
  V. Novel Approaches to Landscapes in Cultural Heritage
  Chairman: Eirini Papageorgiou
- 15:30 - 16:00 Coffee Break
- 16:00 - 18:30 EU COST Action TD1406, 4D-CH-WORLD and EU H2020 INCEPTION joint session
  Full / Project Papers
  VI. Heritage Building Information Model (HBIM)
  Chairmen: Prof. João Martins, Prof. A. Doulamis and Prof. Roberto di Giulio

Friday 4/11

- 09:00 - 10:00 **Keynote speaker: Mr. Jean-Pierre Massué**
  A Euro-Med initiative: Proposal to set up "Cultural Heritage Advisors for Civil Protection in emergency situations and Military Authorities in case of conflicts situation
  Keynote speaker: Prof. Dr. Mustafa Erdik
  Earthquake Protection of Museum Displays
- 10:00 - 10:30 Full / Short Papers
  Intangible Heritage Digital Documentation
- 10:00 - 10:30 Full / Project / Short Papers
  VII. Digital Cultural Heritage in Education, Learning and Training
  Chairwoman: Vasiliki Nikolakopoulou
- 10:30 - 11:00 Coffee Break
- 11:00 - 13:00 Full / Project / Short Papers
  VII. Digital Cultural Heritage in Education, Learning and Training
  Chairman: Georgios Leventis
- 13:00 - 14:00 Lunch
- 14:00 - 15:30 Full / Project / Short Papers
  VIII. Visualisation, VR and AR and Serious Games
  Chairwoman: Margarita Papaefthymiou
- 15:30 - 16:00 Coffee Break
- 16:00 - 18:30 **JOINT WORKSHOPS on Virtual Reality, Gamification and Cultural Heritage & 3rd International Workshop on 3D Research Challenges in Cultural Heritage**
- 19:00 Free

Saturday 5/11

- 09:00 - 09:30 **Keynote speaker: Prof. Dr. Gunnar Liestøl**
  Beyond Pokémon GO. Storytelling, Mobile Augmented Reality and Cultural Heritage.
- 09:30 - 10:30 Full / Project / Short Papers
  IX. Non Destructive Techniques and Digital Applications for Materials' Preservation and Conservation in Cultural Heritage
  Chairman: Ganetsos Theodoros
- 10:30 - 11:00 Coffee Break
- 11:00 - 13:00 Full / Project / Short Papers
  IX. Non Destructive Techniques and Digital Applications for Materials' Preservation and Conservation in Cultural Heritage
  Chairman: Ganetsos Theodoros
- 13:00 - 14:00 Lunch
- 14:00 – 15:30 **Closing Ceremony**

WORKSHOPS

▪ JOINT WORKSHOPS: 1st INTERNATIONAL WORKSHOP on VIRTUAL REALITY, GAMIFICATION AND CULTURAL HERITAGE & 3rd INTERNATIONAL WORKSHOP on 3D RESEARCH CHALLENGES IN CULTURAL HERITAGE

Date: Friday 4th November, 16.00-18.30 p.m.

Hononary Chair Nadia Magnenat-Thalmann, MIRALab, University of Geneva, Switzerland
Chairs Andreas Lanitis, Cyprus University of Technology, Cyprus
Despina Michael, Cyprus University of Technology, Cyprus
Program Committee
Andreas Aristidou, The Interdisciplinary Center, Herzliya, Israel
Yiorgos Chrysanthou, University of Cyprus
George Papagiannakis, University of Crete & FORTH, Greece
Maria Roussou, Makebelieve Design & Consulting, Greece
Georgios Stylianou, European University Cyprus
Yvain Tisserand, MIRALab, University of Geneva, Switzerland

The 1st International Workshop on Virtual Reality, Gamification and Cultural Heritage (VRGCH'2016) is organized by the Social Computing Research Centre (http://socialcomputing.eu/) of the Cyprus University of Technology. It is an international forum devoted specifically to the applications of Virtual Reality and Computer Games in the field of digital Cultural Heritage.

Topics.
The introduction of the first generation of virtual reality systems for consumers along with the latest developments in computer game technologies has provided numerous new possibilities of using Virtual Reality for Cultural Heritage related applications. The aim of VRGCH'2016 is to provide a forum for discussing the latest developments in the areas of Virtual Reality, gamification and Cultural Heritage so that novel applications and future perspectives are exposed to workshop delegates.
Topics of interest include, but are not limited to:
• Advances in the field of Virtual Reality/Computer Games related to digital Cultural Heritage • Gamification and Cultural Heritage • Avatars, Presence and Cultural Heritage Applications • Novel applications of Virtual Reality/Computer Games in the field of Cultural Heritage • User Evaluation of Virtual Reality/Computer Games in Cultural Heritage applications

Additional Information.
The workshop is organized as part of the project NOTRE (Network for Social Computing Research - http://notre.socialcomputing.eu/). The NOTRE project is a 3-year project funded by Horizon 2020 Twinning Programme 2015.

- JOINT WORKSHOP BETWEEN DARIAH-CY, i-TREASURES, DARIAH-MT, H2020-TERPSICHORE, 4D-CH-WORLD, ITN-DCH AND EUROPEANA-SPACE on THE E-DOCUMENTATION OF EUROPEAN INTANGIBLE HERITAGE

Date: Friday 4th November, 10.00-18.30 p.m.

09:00-10:00	**Keynote Speeches @ EuroMed2016** ***(open to all the participants)***	
10:00-10:05	Welcome The ICT Challenges in digital Humanities: The complexity of the Intangible CH documentation	Dr. Marinos Ioannides (CUT)
10:05-10:25	Participatory approaches in cultural heritage - some experiences in crowdsourcing	Prof. Milena Dobreva (DARIAH-MT)
10:25-10:45	Performing the Archive – how dance archives face digitalization in order to serve the digital humanities	Mr. Michael Freund (Dachverband Tanz Deutschland)
10:45-11:00	The EU Project Terpsichore Approach for the e-documentation of Folklore	Prof. Anastasios Doulamis (NTUA)
Coffee will be served in the room until lunch break		
11:00-11:20	Welcome Introduction to i-Treasures project	Dr. Nikos Grammalidis (CERTH)
11:20-11:40	The UNESCO approach to ICH	Dr. Ioannis Poulios (UCL)
11:40-12:00	New educational tools for ICH	Dr. Francesca Pozzi (CNR) (via skype)
12:00-12:20	New technologies for body/motion analysis in ICH expressions	Mr. Sohaib Laraba (UMONS)
12:20-12:40	Serious games for ICH learning	Dr. Nikos Grammalidis (CERTH)
12:40-13:00	Semantic analysis of ICH	Dr. Spiros Nikolopoulos (CERTH)
13:00-14:00	**Lunch break**	
14:00-14:20	The i-Treasures platform	Mr. Dimitrios Theodorou (UOM)
14:20-15:00	Demonstration of i-Treasures technologies • Generic game application for human motion capture and learning of traditional and contemporary dance • Text-to-Song synthesis for traditional singing	
15:00-15:30	Discussion	
15:30-16:00	**Coffee break**	
16:00-16:20	Digital and handcrafting processes applied to sound-studies of archaeological bone flutes	Etienne Safa
16:20-16:45	The Europeana Sounds Music Information Retrieval Pilot	Alexander Schindler
16:45-17:00	Exploiting agriculture as an Intangible Cultural Heritage: the case of the Farfalla Project	Alessandro Pozzebon
17:00-17:15	How to handle all the Data?	Ursula Warnke
17:15-17:30	Image Hybrid Recommendation System for Cultural Heritage Applications	Eftychios Protopapadakis
17:30-17:45	A Deep Learning based Approach towards Building Recognition	Konstantinos Makantasis
17:45-18:00	Discussion	
18:00-18:30	**Conclusions from the Workshop**	Dr. Nikos Grammalidis (CERTH) Dr. Marinos Ioannides (CUT) Prof. Milena Dobreva (DARIAH-MT) Prof. Anastasios Doulamis (NTUA) Mr. Michael Freund (Dachverband Tanz Deutschland)

PAPER SESSIONS

Monday 31st October 2016

TIME	PLENARIES AND SESSIONS
08:30 - 18:30	REGISTRATIONS AND EXHIBITIONS
09:00 - 10:30	OPENING CEREMONY AND EUROMED BEST PAPER AWARDS
	KEYNOTE SPEAKERS: Prof. Dr. Antonia Moropoulou Study, implementation and monitoring: Scientific integrated governance for the rehabilitation of the Holy Aedicule of the Holy Sepulcher in Jerusalem Prof. Dr. Dieter Fellner Digitization – Use – Restoration in 3+D: Challenges and Open Issues
10:30 - 11:00	Coffee Break
11:00 - 13:00	FORUM PANEL on Erasing History and the Role of Documentation in Tracking and Proving Ownership of Looted Cultural Property Chairwoman: Eleanor Fink
13:00 - 14:00	Lunch
14:00 - 15:30	FORUM PANEL on Re-Thinking Management and Valorization of Middle East Cultural Heritage in the Post-War period: Where Disasters Turns to Opportunity, Development and Growth Chairman: Georgios G. Giannoulis
15:30 - 16:00	Coffee Break
16:00 - 17:00	EU H2020 INCEPTION PROJECT PANEL on 3D Semantics in Cultural Heritage Chairman: Prof. Dr. Roberto Di Giulio
17:00 - 18:30	EU PROJECT E-SPACE PANEL on Reusing Digital Cultural Heritage: Boosting Education, Audience Engagement, Business Creation Europeana Sounds, EU ScreenXL, Europeana Fashion, Europeana Food&Drink, Photoconsortium, Energic-Od, Disruptive Media Learning Lab, Preforma Chairwoman: Prof. Dr. Sarah Whatley
19:00	Free

Monday 31st October 2016

- **FORUM PANEL** on ERASING HISTORY AND THE ROLE OF DOCUMENTATION IN TRACKING AND PROVING OWNERSHIP OF LOOTED CULTURAL PROPERTY

(for details, please check page 20)

- **FORUM PANEL** on RE-THINKING MANAGEMENT AND VALORIZATION OF MIDDLE EAST CULTURAL HERITAGE IN THE POST-WAR PERIOD: WHERE DISASTERS TURNS TO OPPORTUNITY, DEVELOPMENT AND GROWTH

(for details, please check page 23)

- **EU H2020 INCEPTION PROJECT PANEL** on 3D SEMANTICS IN CULTURAL HERITAGE

(for details, please check page 25)

- **EU PROJECT E-SPACE PANEL** on REUSING DIGITAL CULTURAL HERITAGE: BOOSTING EDUCATION, AUDIENCE ENGAGEMENT, BUSINESS CREATION

(for details, please check page 25)

Tuesday 1st November 2016

TIME	PLENARIES AND SESSIONS
08:30 - 18:30	**REGISTRATIONS AND EXHIBITIONS**
09:00 - 10:00	**KEYNOTE SPEAKER:** **Prof. Dr. Wolfgang Kippes** **On monuments and museums. From reputation to economic driver - the role of culture is moving** **Mr. Axel Ermert** **The Role of Terminology for Cultural Heritage**
10:00 - 10:30	**PROJECT / SHORT PAPERS** **I. From Data Acquisition to Metadata, Semantics and Ontologies in Cultural Heritage** Chairman: Matevz Domajnko
10:30 - 11:00	**Coffee Break**
11:00 - 13:00	**PROJECT / SHORT PAPERS** **I. From Data Acquisition to Metadata, Semantics and Ontologies in Cultural Heritage** Chairman: Charalabos Ioannidis
13:00 - 14:00	**Lunch**
14:00 - 15:30	**FULL / PROJECT / SHORT PAPERS** **II. Innovative methods on Risk Assessment, Monitoring and Protection of Cultural Heritage** Chairman: Elias Nobilakis
15:30 - 16:00	**Coffee Break**
16:00 - 18:30	**EXHIBITORS SESSION**
	FULL / PROJECT / SHORT PAPERS **III. The New Era of Museums and Exhibitions-Digital Engagement and Dissemination** Chairwoman: Marleen de Kramer
19:00	**Social Dinner**

Tuesday 1st November 2016 | 10:00 - 10:30 and 11:00-13:00

I. From Data Acquisition to Metadata, Semantics and Ontologies in Cultural Heritage

▪ DIGITAL PRESERVATION OF CULTURAL HERITAGE: BALINESE KULKUL ARTEFACT AND PRACTICES (Project paper)

Cokorda Pramartha et al.

Abstract:

One of the goals of digital preservation of cultural heritage is to gather, refine, maintain, and share cultural resources that can subsequently be used and developed by scholars, members of the community, and future generations. We present the details of our research dealing with one aspect of Balinese culture, the Balinese traditional communication system (*kulkul*), undertaken in the Indonesian island of Bali. We introduce a new framework based on Balinese cultural principles (*Tri Hita Karana* and *Desa Kala Patra*) to capture, classify, and organize cultural artefact and practice knowledge, and design and develop an online digital portal prototype to enable the sharing and growth of knowledge related to the Balinese *kulkul*. This knowledge is held largely in tacit form in the Balinese community, poorly documented, and fragmented, which makes the preservation difficult and yet crucial. The aim of the project is to document, preserve, and educate the Balinese community and the younger generations in particular on an important aspect of Balinese culture. This community will be encouraged not only to learn about *kulkul* and related practices but also contribute their own knowledge to enable the online digital portal to evolve into a living repository of Balinese cultural knowledge. The basic *kulkul* knowledge and understanding was obtained through in-depth interviews with selected Balinese cultural experts and knowledgeable community members (Professors from a Balinese University, spiritual leaders, senior community leaders, and craftsmen). As part of the digital portal, our project also includes the development of a basic ontology of key *kulkul*-related concepts and terms, and their inter-relationships to support the semantic searching and browsing of online resources.

▪ SURVEYING ILLUSORY ARCHITECTURES PAINTED ON VAULTED SURFACES (Project paper) *(No presentation due to obligations)*

Matteo Flavio Mancini et al.

Abstract:

This paper addresses the problem of surveying illusory architectures painted on vaulted surfaces. The survey of a *quadratura*, or a painting in general, requires recording the metric and chromatic characteristics of the subject and the typical characteristics of the painted surfaces, such as soot, engravings, and *giornate*. Our goals are the proposal of an “optimum” quality standard for surveying curved painted surfaces and testing a method to acquire and render the data that allows those standards to be met. The test, conducted on the corridor of Saint Ignatius of Loyola rooms in Rome depicted by Andrea Pozzo, shows how the quality of the texture can be measured in terms of overall sharpness and average resolution. It is also shown how it is possible to identify some reference standards that allow the quality of the final result to be determined already in the photography phase of the project.

▪ THE APPLICATION OF PHOTOGRAMMETRY ON DIGITIZATION AND PROMOTION FOR MONUMENTS AND TEMPLES IN TAIWAN – TAKING CHUA FAMILY ANCESTRAL TEMPLE AS AN EXAMPLE (Project paper)

Wun-Bin Yang et al.

Abstract:

This study carried out the digitization work for monuments and temples in Taiwan by using photogrammetry; used 3D Laser Scanning Point Cloud Data as the basic information for the result analysis of photogrammetry to get the accuracy assessment of photogrammetry and 3D laser scanning; and built the standard operation procedure of photogrammetry in Taiwan traditional temples. Moreover, in order to popularize the rapid modeling of photogrammetry, a workshop was held specially and used CIPA 3x3 rules which were published in annual meeting of CIPA2015 to carry out educational and learning work to combine the digitization of cultural property and public participation.

▪ 3D ACQUISITION, PROCESSING AND VISUALIZATION OF ARCHAEOLOGICAL ARTIFACTS. THE SAMARRA COLLECTION OF THE MUSEUM OF ISLAMIC ART IN BERLIN (Project paper)

Arie Kai-Browne et al.

Abstract:

In the past decade there has been a steady increase in research projects dealing with the three-dimensional documentation of cultural heritage. While 3D-scanners and photogrammetry are widely used for documenting historical monuments and archaeological excavations, the application of this technology within museums has not yet been established within the daily work routine. Even though the benefits of 3D-documentation are quite manifold, usually only outstanding artifacts are being recorded in this manner due to the complex workflows for deriving datasets, which can be used for further research and knowledge transfer. The interdisciplinary research project MOSYS-3D has been dealing with the entire workflow ranging from data acquisition, pre- and postprocessing steps as well as testing different forms of visualizations.

▪ PHOTOCONSORTIUM: DIGITIZING EUROPE'S PHOTOGRAPHIC HERITAGE (Project paper)

Frederik Truyen et al.

Abstract:

Photoconsortium is an association of photographic archives that contributed over 450.000 images of early photography to Europeana. In this contribution we discuss lessons learned, in particular on digitization and copyright issues and describe the activities involved in managing state-of-the-art digitized photographic archives. We discuss follow-on project activities such as Europeana Space, which focuses on creative reuse of digitized cultural heritage and the Europeana thematic photography channel.

- **FIRST EXPERIENCES OF APPLYING A MODEL CLASSIFICATION FOR DIGITAL 3D RECONSTRUCTION IN THE CONTEXT OF HUMANITIES RESEARCH** (Project paper)

Sander Münster et al.

Abstract:

While technological backgrounds, project opportunities, and methodological considerations for application are widely discussed, there is still no comprehensive classification scheme for digital 3D reconstruction in humanities research projects. Therefore, we developed a prototype scheme in 2016. In this article we present the first results of applying this scheme and classifying five projects. Within this application we tested for intercoder reliability and for potential weaknesses of the scheme. While the reliability of the proposed scheme is generally good for categories with discrete values, qualitative categories result in highly differing coding.

- **INTERNAL 3D PRINTING OF INTRICATE STRUCTURES** (Project paper)

Théophane Nicolas et al.

Abstract:

Additive technologies are increasingly used in Cultural Heritage process, for example in order to reproduce, complete, study or exhibit artefacts. 3D copies are based on digitization techniques such as laser scan or photogrammetry. In this case, the 3d copy remains limited to the external surface of objects. Medical images based digitization such as MRI or CT scan are also increasingly used in CH as they provide information on the internal structure of archaeological material. Different previous works illustrated the interest of combining 3D printing and CT scan in order to extract concealed artefacts from larger archaeological material. The method was based on 3D segmentation techniques within volume data obtained by CT scan to isolate nested objects. This approach was useful to perform a digital extraction, but in some case it is also interesting to observe the internal spatial organization of an intricate object in order to understand its production process. We propose a method for the representation of a complex internal structure based on a combination of CT scan and emerging 3D printing techniques mixing colored and transparent parts. This method was successfully applied to visualize the interior of a funeral urn and is currently applied on a set of tools agglomerated in a gangue of corrosion.

- **INTERCONNECTING OBJECTS, VISITORS, SITES AND (HI)STORIES ACROSS CULTURAL AND HISTORICAL CONCEPTS: THE CROSSCULT PROJECT** (Project paper)

Costas Vassilakis et al.

Abstract:

Human History, is a huge mesh of interrelated facts and concepts, spanning beyond borders, encompassing global aspects and finally constituting a shared, global experience. This is especially the case regarding European history, which is highly interconnected by nature; however, most History-related experiences that are today offered to the greater public, from schools to museums,

are siloed. The CrossCult project aims to provide the means for offering citizens and cultural venue visitors a more holistic view of history, in the light of cross-border interconnections among pieces of cultural heritage, other citizens viewpoints and physical venues. To this end, the CrossCult project will built a comprehensive knowledge base encompassing information and semantic relationships across cultural information elements, and will provide the technological means for delivering the contents of this knowledge base to citizens and venue visitors in a highly personalized manner, creating narratives for the interactive experiences that maximize situational curiosity and serendipitous learning. The CrossCult platform will also exploit the cognitive/emotional profiles of the participants as well as temporal, spatial and miscellaneous features of context, including holidays and anniversaries, social media trending topics and so forth.

▪ TOWARDS MONUMENTS' HOLISTIC DIGITAL DOCUMENTATION – THE SAINT NEOPHYTOS ENKLEISTRIOTIS CASE STUDY (Project paper)

Marinos Ioannides et al.

Abstract:

The expansion of the term "monument" to include the surrounding area of the tangible cultural asset, its natural environment as well as the intangible data relating to its existence and use has gradually resulted the formation of the term "cultural landscapes". "Monument" has evolved into "monumental place" and a "place with its own soul" and nowadays into a "unity" incorporating the multiple and diversified views which regard the one and single object, the cultural asset. In this paper and through the presented case study of Saint Neophytos Enkleistriotis monument, we attempt to move further on, from the view of the "unity" and the interdisciplinary approach to the "holistic" view, treating the cultural asset as a "whole"; a "whole" which will have been created from the harmonious merge of all the multifaced entities of which it is comprised.

▪ DEVELOPMENT OF PHOTOGRAMMETRIC DOCUMENTATION OF THE BOROUGH AT BISKUPIN BASED ON ARCHIVAL PHOTOGRAPHS - FIRST RESULTS (Short paper)

Dorota Zawieska et al.

Abstract:

This paper presents the initial results of research work carried out as part of a project entitled "The design of development of the Lusatian culture settlement at Site 4 at Biskupin: pre-war research work" financed by the Ministry of Culture and National Heritage, within the National Heritage 2016 Programme, "Conservation of archaeological monuments". The high quality of photographic documents results from the professional, technical and organizational facilities organized by the Biskupin Expedition during the period 1934-1939. A group of photographs acquired from various heights at that time were selected (an aeroplane, a barrage balloon, an observational balloon and terrestrial photographs); these were used for further processing. Using photographs, a true orthoimage, 3D vector models and a 3D visualization of photorealistic models were generated. This paper presents the methodology and stages of the technological process of generation of photogrammetric documentation based on archival data. The benefits and disadvantages of the conventional photogrammetric approach are discussed, and a modified approach involving the application of commonly-used computer vision algorithms is also presented.

- **CAPTURING OUR CULTURAL INTANGIBLE TEXTILE HERITAGE, MOCAP AND CRAFT TECHNOLOGY** (Short paper)

Eva Andersson Strand et al.

Abstract:

Textile craft and textile design have always had an important social, cultural and economic impact on both individuals and societies. The cultural heritage of textiles does not end with the preservation and collection of costumes and other textiles in museums. It includes living traditions inherited from our ancestors. Furthermore, understanding craft and craft processes are crucial when considering both past societies and the cultural heritage of humankind. The study of intangible processes, hidden within archaeological objects, crafts, action and activities as well as cognitive processes, involves both practical and theoretical considerations. Today, computer applications such as Motion Capture can enhance our knowledge of the complexity and variety of artifacts, their production, and how various craft traditions develop over time, yielding new insights and perspectives applicable to ancient societies as well as to traditional craft today.

- **APPLYING DEEP LEARNING TECHNIQUES TO CULTURAL HERITAGE IMAGES WITHIN THE INCEPTION PROJECT** (Short paper) ***(No presentation due to obligations)***

Jose Llamas et al.

Abstract:

The digital documentation of cultural heritage (CH) often requires interpretation and classification of a huge amount of images. The INCEPTION European project focuses on the development of tools and methodologies for obtaining 3D models of cultural heritage assets, enriched by semantic information and integration of both parts on a new H-BIM (Heritage - Building Information Modeling) platform. In this sense, the availability of automated techniques that allow the interpretation of photos and the search using semantic terms would greatly facilitate the work to develop the project. In this article the use of deep learning techniques, specifically the convolutional neural networks (CNNs) for analyzing images of cultural heritage is assessed. It is considered that the application of these techniques can make a significant contribution to the objectives sought in the INCEPTION project and, more generally, the digital documentation of cultural heritage.

- **REACHING THE WORLD THROUGH FREE LICENSES AND WIKIMEDIA'S CROWDSOURCED PLATFORMS** (Short paper)

John Andersson

Abstract:

Wars and disasters, negligence and poor maintenance mean that much of our immovable cultural heritage is at risk of being lost forever. Interest and knowledge is needed to avoid its destruction. The Connected Open Heritage project will work to gather as much information as possible about cultural heritage from countries all over the world and connect it in a standardized and structured form on Wikidata, a project that is operated by the Wikimedia movement. It will connect the

structured data with historical images from digitized collections from archives and museums and with freely licensed modern images and other types of media gathered by volunteers and other organizations. The Connected Open Heritage is a project by Wikimedia Sverige, UNESCO, Cultural Heritage without Borders and Wikimedia Italia, and financed by the Culture Foundation of the Swedish Postcode Lottery.

▪ CH DIGITAL DOCUMENTATION AND 3D SURVEY TO FOSTER THE EUROPEAN INTEGRATION PROCESS: THE CASE STUDY OF GEGUTI PALACE IN KUTAISI, GEORGIA (Short paper)

Marco Medici et al.

Abstract:

The European integration process brings countries closer to each other, breaking down barriers to mobility and fostering cooperation. As a result of these long-term processes, the European societies feature a large diversity of values and lifestyles, views and beliefs, identities and cultures that influence on daily basis the European economy, society, politics and law. Studies contributing to the understanding of Europe's intellectual basis, creative capacity, cultural identity and history rely more and more on digital expressions of culture and identity. Advanced research and modelling and preservation technologies maximize the value of tangible and intangible heritage and of collections in libraries, archives, museums, galleries and other public.

Tuesday 1st November 2016 | 14:00 - 15:30

II. Innovative Methods on Risk Assessment, Monitoring and Protection of Cultural Heritage

▪ APPLICABILITY OF 3DVE INDICATOR FOR CULTURAL HERITAGE LANDSCAPE MANAGEMENT (Full paper)

Jaeyong Lee et al.

Abstract:

Uniformly control of the height of buildings owned by individuals to protect cultural heritage landscape causes social conflicts. Thus, it is necessary to introduce an indicator that can simultaneously evaluate the criteria for control of the height of buildings (CCBH) for urban development and cultural heritage landscape management. We developed 3D Visual Exposure (3DVE) as a useful indicator to review the validity of the CCBH around cultural heritage. By using the 3DVE, it was possible to calculate visibility and we succeeded in mapping the opportunity of view on 3D geospatial information and evaluating landscape variation with statistics through changing building heights around cultural heritage. We predict that the 3DVE presented in this study will have high utilization as an indicator for the cultural heritage landscape management.

▪ RISK ANALYSIS AND VULNERABILITY ASSESSMENT OF ARCHAEOLOGICAL AREAS FOR THE PREVENTIVE CONSERVATION (Full paper)

Giuliana Quattrone

Abstract:

The territorial structure of archaeological sites is often compromised by a variety of factors which, over time, can contribute to aggravate the deteriorating conditions of the archaeological areas. Natural disasters, often, have caused irreversible damage (crashes, loss of finds, etc.) at the archeological sites. The paper shows the results of research aimed at developing an innovative risk assessment model, oriented to sustainability criteria, that can provide help in making decisions process about the protection, conservation and valorization of archaeological areas. The proposed work presents a logical and operative model suitable to estimate the actual risk condition for archeological sites developed by integrating the information concerning vulnerability of archeological areas and the danger condition of the sites upon which they are located. The determination of the risk, derived from the evaluation of potential co-presence of independent sources of danger within a given geographical area, has been modeled by a type of approach multi hazard. The methodology is applied at the case study of archaeological area of Sybari in Calabria Region, in south of Italy, where tried to develop an integrated and coordinated cognitive methodology - evaluation within an overall information system for assessing the vulnerability of archaeological heritage and environmental dangerousness in order to identify the level of risk which is under the archaeological area in relation to the territory of reference. The results obtained allow to relate the risk with the risk factors, the detection of damage on archaeological heritage in question, determine the tolerance threshold within which it is possible the preservation of goods and to propose a synthesis strategy between environmental protection and sustainable exploitation.

- **TAKING THE NEXT STEP IN DIGITAL DOCUMENTATION OF HISTORIC CITIES. HOW HERMES EVOLVED IN AN OPEN DATA DIGITAL LIBRARY OF HISTORIC BUILDINGS** (Full paper)

Pavlos Chatzigrigoriou

Abstract:

When a long-term research finishes, there is always a question about implementation and further development. In the case of HER.M.e.S, the Digital Heritage Management System of the Historic City of Hermoupolis, in a Greek Aegean Island, Syros, it was also a question about raising awareness. The research proved that 2.4 historic buildings collapse every year, as a result of abandonment. This phenomenon was intensified by the severe economic crisis in Greece. The research proposed an optimal conservation plan for the city, after carefully evaluating variables through a multi-criteria model using GIS and an innovating point system. But in order to apply this plan, we need to be able to update the data, as buildings are constantly changing through time. Updating a database with more than 1000 historic buildings, with no funds, is a huge challenge. Soon, we decided that the only way to go is to use a crowdsourcing method. Developing a digital heritage collection portal, using free open source software and serving crucial data for every building, was the answer to our problem. We asked citizens to check the data base, report mistakes, updates, stories, photographs and use the portal to learn about their city. This effort led us to a big digitization project, with up to 1290 historic buildings, 14.400 geo-tagged photos and more than 15.000 fields of information. The project HERMeS, as a conservation plan and a heritage digitization project won the 2015 European Union Europa Nostra Award.

- **DISASTER-RISK INDICATORS AND THEIR EVALUATION, COMMUNICATION FOR TRADITIONAL SETTLEMENT** (Project paper)

Alex Ya-Ning Yen et al.

Abstract:

Disaster-risk management has become an important issue in the conservation of cultural heritage since the beginning of 21th century. However, the implementation procedure of the disaster-risk management was mainly focused on single monument and short of the research for the settlements which is still a big challenge for us. In 2005, to comply with the international trend, Taiwan amended the Cultural Heritage Conservation Act, in which settlements as a new category of monuments were declared - "Settlement: a group of buildings, street houses, settlements which have architectural style, landscape, historical, artistic or scientific value." This research develops disaster-risk indicators for the traditional settlement and takes Quion-lin settlement, a World Heritage potential site as an example, analyzing the procedure to set up a network of conservation value and the disaster-risk indicators for traditional settlement. GIS will play as an important tool for the integration and communication within the stakeholders.

- **PERVASIVE WIRELESS SENSOR NETWORKS FOR THE MONITORING OF LARGE MONUMENTAL STRUCTURES: THE CASE OF THE ANCIENT CITY WALLS OF SIENA** (Project paper)

Alessandro Pozzebon et al.

Abstract:

In this paper, a solution for the pervasive monitoring of large monumental structures based on the use of Wireless Sensor Networks is presented. In particular, the paper focuses on the case of the Ancient City Walls of the city of Siena, Italy, that still surround the whole historic centre and require a real time monitoring of the cracks present is several points. Two different network topologies are presented for the deployment of a pervasive monitoring infrastructure, and a novel sensing platform based on the use of Hall effect based sensors is presented. The architecture of the whole sensor node is described, together with the laboratory test phase that proves the effectiveness of the proposed solution. The proposed solution is expected to be deployed in a 1.8km section of the city walls in the next months.

- **THE PROTECTION OF CULTURAL HERITAGE SITES FROM GEO-HAZARDS: THE PROTHEGO PROJECT** (Short paper)

Kyriacos Themistocleous et al.

Abstract:

Examining natural hazards responsible for cultural heritage damages all over Europe, especially over large or remote areas is extremely difficult, expensive and time consuming. There is a need identify and respond to natural hazards before they create irreparable damage to cultural heritage sites. The PROTHEGO project uses radar interferometry to monitor surface deformation with mm precision to analyze the impact of geo-hazards in cultural heritage sites in Europe. The project applies novel InSAR techniques to monitor monuments and sites that are potentially unstable due to landslides, sinkholes, settlement, subsidence, active tectonics as well as structural deformation, all of which could be affected of climate change and human interaction. To magnify the impact of the project, the approach will be implemented in more than 400 sites on the UNESCO World Heritage List (WHL) in geographical Europe. After the remote sensing investigation, detailed geological interpretation, hazard analysis, local-scale monitoring, advanced modelling and field surveying for the most critical sites will be carried out to discover the cause and extent of the observed motions. PROTHEGO (PROTection of European Cultural HEritage from GeO-hazards) is a collaborative research project funded in the framework of the Joint Programming Initiative on Cultural Heritage and Global Change (JPICH) – Heritage Plus in 2015–2018.

Tuesday 1st November 2016 | 16:00 - 18:30

III. The New Era of Museums & Exhibitions: Digital Engagement and Dissemination

▪ CULTURECAM: AN INTERACTIVE SEARCH TOOL FOR SMALL IMAGE GALLERIES (Full paper)

Sergiu Gordea et al.

Abstract:

As a result of digitization initiatives in recent years, most galleries hold digital copies of their masterpieces. In order to attract more visitors, public galleries are interested in advertising their content on websites and tourist-centric applications deployed in public spaces. The online version of CultureCam has the goal of stimulating the reuse of cultural heritage content by creative designers. In this paper, we present the Interactive Installation version of CultureCam tool, which has the goal of attracting the interest of public users when exploring public galleries. It concentrates on enhancing the user experience, by offering access to the images in an immersive environment, using an intuitive, easy-to-use tool that supports touch free interaction with the gallery content. A novel image similarity search algorithm was developed in order to adapt to user expectations when searching in small image datasets. The user feedback collected from exhibitions in different European cities indicates a very high acceptance of the CultureCam tool by the public. The intuitive and seamless interaction with the tool, as well as the automation and enhancement of the search algorithm are the main improvements over the previous version of CultureCam.

▪ LEARNING ALGORITHMS FOR DIGITAL RECONSTRUCTION OF VAN GOGH'S DRAWINGS (Full paper)

Yuan Zeng et al.

Abstract:

Many works of Van Gogh's oeuvre, such as letters, drawings and paintings, have been severely degraded due to light exposure. Digital reconstruction of faded color can help to envisage how the artist's work may have looked at the time of creation. In this paper, we study the reconstruction of Vincent van Gogh's drawings by means of learning schemes and on the basis of the available reproductions of these drawings. In particular, we investigate the use of three machine learning algorithms, k-nearest neighbor (kNN) estimation, linear regression (LR), and convolutional neural networks (CNN), for learning the reconstruction of these faded drawings. Experimental results show that the reconstruction performance of the kNN method is slightly better than those of the CNN. The reconstruction performance of the LR is much worse than those of the kNN and the CNN.

- **IMAGING NOVECENTO. A MOBILE APP FOR AUTOMATIC RECOGNITION OF ARTWORKS AND TRANSFER OF ARTISTIC STYLES** (Project paper)

Federico Becattini et al.

Abstract:

Imaging Novecento is a native mobile application that can be used to get insights on artworks in the "Museo Novecento" in Florence, IT. The App provides smart paradigms of interaction to ease the learning of the Italian art history of the 20th century. Imaging Novecento exploits automatic approaches and gamification techniques with recreational and educational purposes. Its main goal is to reduce the cognitive effort of users versus the complexity and the numerosity of artworks present in the museum. To achieve this the App provides automatic artwork recognition. It also uses gaming, in terms of a playful user interface which features state-of-the-art algorithms for artistic style transfer. Automated processes are exploited as a mean to attract visitors, approaching them to even lesser known aspects of the history of art.

- **TOWARDS THE DESIGN OF A USER-FRIENDLY AND TRUSTWORTHY MOBILE SYSTEM FOR MUSEUMS** (Project paper)

Kostas Koukoulis et al.

Abstract:

Designing mobile applications for enhancing user visiting experiences in museums is a current trend. This paper discusses the current work on mobile applications that are dedicated to museums. Following a specific methodology, we propose specific user and app classification requirements. Based on those requirements, we present the design of a user-friendly and trustworthy mobile system prototype that includes functionality needed from such institutions. We adopt suitable authorization mechanisms permitting specific operations to various user groups. We evaluate the proposed system design comparing it with other known systems following a specific usage scenario. We feel that this study could help on the design and implementation of trustworthy mobile-based museum visiting applications.

- **DIGITAL TECHNOLOGIES IN THE MUSEUM: SAME OLD, SAME OLD?** (Short paper)

Inge Kalle-den Oudsten

Abstract:

Digital technologies are often said to be open, democratic, social and participatory. These qualities are also associated with the concept of the post-museum. This paper explores the use of the digital in museums. It is argued that museums often employ new media to perpetuate traditional narratives rather than capitalise their transformative potential in order to change.

▪ **A PERSONAL TOUR OF CULTURAL HERITAGE FOR DEAF MUSEUM VISITORS** (Short paper)

Vaso Constantinou et al.

Abstract:

This paper describes the first milestone and results of an ongoing project involving the implementation and pilot testing of an application aiming to promote cultural heritage and dissemination of information with the use of interactive small screen technology. The bespoke application was designed for deaf visitors to enable a museum experience without the support of a physical sign language interpreter. The application was pilot tested in the Pattichion Municipal Museum in Cyprus. Our findings showed high levels of user satisfaction and usefulness of the application in allowing deaf museum visitors to have an enjoyable tour, using their mobile devices as the only means of support.

▪ **SIGNET: A DIGITAL PLATFORM FOR HELLENISTIC SEALINGS & ARCHIVES** (Short paper)

Stefano G. Caneva et al.

Abstract:

The paper provides an overview of the SigNet Project with special attention to the implementation of a digital agenda fitting the dual purpose of promoting scientific research in the specialized disciplines of sigillography and numismatics and of bridging their gap with the broader field of cultural heritage. Focus is in particular on the role of interdisciplinary, open linked databases of big data and on the promotion of citizen science.

▪ **PLACES SPEAKING WITH THEIR OWN VOICES. A CASE STUDY FROM THE GRA.FO ARCHIVES** (Short paper)

Alessandro Pozzebon et al.

Abstract:

This paper proposes a novel approach for the fruition of cultural heritage based on the “Augmented Cultural Heritage” paradigm. This expression has been used to describe the improvement to the visit to a Tangible Cultural Site with additional Intangible Cultural Assets like audio recordings or oral testimonies. The proposed approach is applied to the area of the Montagna Pistoiese, Tuscany, Italy: in this case the visit to the site is enriched by providing visitors with oral material coming from the “Anna Buonomini” archive, a collection of audio recordings of high historical and cultural value. The audio files are geo-referenced and associated to a specific position in the area. The user is able to hear a recording only when he/she reaches the specific geographical point associated with the file. The audio is played adaptively with the distance to the point, so as to emulate a real voice coming from the place.

- **PAINTINGS ALIVE: A VIRTUAL REALITY-BASED APPROACH FOR ENHANCING THE USER EXPERIENCE OF ART GALLERY VISITORS** (Short paper)

Stavros Panayiotou et al.

Abstract:

Visits to art museums are not appealing to a wide sector of the public, limiting in that way the exposure of art works to the wider community and especially the younger generation. In this paper we investigate the use of Virtual Reality (VR) for displaying animated artworks as a means for creating an enhanced user experience that could make visits to art-galleries more appealing. A key point of the proposed technique is the analysis of the art-works that enables the determination of a most appropriate setting and animation that best promotes the original message of the painter. The promise of this approach has been validated through an experimental user evaluation where users clearly indicated the benefits of using interactive virtual environments for presenting animated art paintings.

- **DIGITAL DOCUMENTATION AND DIGITAL PROTOTYPING OF SACRED ARTWORK OF MUSEUM MUSEU MINEIRO – BRAZIL** (Short paper)

Altino Barbosa Caldeira et al.

Abstract:

The paper presents a research about digital documentation and digital prototype methods and techniques used for the artistic collection of the museum Museu Mineiro, Minas Gerais, Brazil. The Museu Mineiro collection is representative of the importance of Baroque art in Brazilian society and architecture. The choice of methods and techniques for digital documentation were based on methodological framework considering the following aspects Scale, Purpose; Use. The digital documentation baroque artwork was performed using hand 3D scanner and reproduction of the digital model was performed with 3D printing of polymeric material deposition. The research concludes that the digital documentation and manufacturing can contribute to the dissemination of the knowledge and information about the artistic and cultural heritage.

- **PARIAN MARBLE: A VIRTUAL MULTIMODAL MUSEUM PROJECT** (Short paper)

Marinos Ioannides et al.

Abstract:

This case study is about the cultural promotion and exploitation of the ancient quarries of Paros island in Greece, in a multilayered project which uses modern technologies attempting to “return” all the marble works that have been created from 7th to 5th century BC to their place of origin. Taking total advantage of the emerging technological affordances of 3-dimensional documentation of Cultural Heritage assets and Virtual and Augmented Reality, this case study’s project is aiming at a curatorial concept of breaking the restrictions of geography and time and raising awareness by engaging stakeholders, policy makers and citizens of Europe in digitalization of heritage through virtual environments. Virtual Cultural Heritage along with Virtual Museums, being the current research advancement in the respective domain, propose the framework where broaden dialogues

and intensified discussions among the people involved in the documentation of the past will take place, as well as fully contextualized educational practices and design studies for the development of new immersive experiences and innovative applications.

▪ IMMERSIVE DIGITAL HERITAGE EXPERIENCE WITH THE USE OF INTERACTIVE TECHNOLOGY (Short paper)

Marinos Ioannides et al.

Abstract:

This paper presents alternative methodologies for disseminating information that derives from a holistic documentation of a monument with the use of interactive technologies. These technologies are incorporated within an interactive book, while the book's context is about the unique monument Panagia of Asinou church in Nicosia (Cyprus). The prototype of the interactive book has been developed at a previous stage as an experimental educational tool. In this phase the prototype will be further developed in order to incorporate all the multimedia data collected about the monument and demonstrate them in a user-friendly way. Moreover, it will be adequately evaluated by specific target groups of users and experts. The goal is to be installed at the church of Asinou and provide the visitors of the church with an amazing immersive experience.

▪ THE CULTURE OF EPIGRAPHY: FROM HISTORIC BREAKTHROUGH TO DIGITAL SUCCESS (Short paper)

(extra presentation, moved from Session-Intangible Heritage Digital Documentation)

Pantelis Nigdelis et al.

Abstract:

The aim of the present paper is to direct attention to new perspectives on the role and integration of epigraphy into the digital age. Nowadays, epigraphic and historical studies undergo a period of remarkable vitality, thanks to the finding of new inscriptions that enhance our understanding on past societies. History gives a great example of an interdisciplinary field, drawing not only on epigraphy, but also on numismatics and other related sciences. Despite the various efforts to digitize epigraphic heritage, the existing databases are primarily intended for specialized audiences, academics or researchers. Without overlooking the educational role of epigraphy, this paper examines and proposes new ways in which inscriptions can become more accessible to wider audiences. To this end, digital media can provide the means for more efficient engaging with the public.

▪ ERFGOEDAPP: AN EDUCATIONAL EXPERIMENT WITH AUGMENTED REALITY, CITYSCAPES AND CAMPUSSCAPES IN BRUSSELS (Project paper)

Marc Jacobs et al. ***(extra presentation, moved from Session-VII)***

Abstract:

In 2015 in Flanders (Belgium) an ErfgoedApp (heritage app) was launched. It was developed by Vidinote and FARO with PixLive. The program allows to construct and use Augmented Reality applications, linked to heritage items, collections and institutions. In 2015-2016 master students in

archaeology, arts sciences and archivists experimented with the app, as part of the course work. They managed to produce applications that work, provided feedback to further develop the App and offered reflection on the relation between heritage work, cityscapes and augmented reality and the differences between working with or towards texts or visual information. Low or no cost for distributing and using the applications in practice in heritage and academic contexts proved possible.

Thursday 3rd November 2016

TIME	PLENARIES AND SESSIONS
08:30 - 18:30	**REGISTRATIONS AND EXHIBITIONS**
08:30 - 10:00	**KEYNOTE SPEAKER:** **Mrs. Rosella Caffo** **Digital museums: the state of the art and the future perspectives** **Prof. Dr. Sarah Whatley** **Preserving the intangible, tools for documenting and sharing folkloric dance** **Mr. Vasco Fassina** **CEN TC 346-Conservation of Cultural Heritage: Update after a 10 Year Period of Activity**
10:00 - 10:30	**FULL / PROJECT / SHORT PAPERS** **IV. 3D Reconstruction and Modelling** Chairman: Diego Bellido Castañeda
10:30 - 11:00	**Coffee Break**
11:00 - 13:00	**PROJECT / SHORT PAPERS** **IV. 3D Reconstruction and Modelling** Chairman: Nicola Carboni
13:00 - 14:00	**Lunch**
14:00 - 15:30	**PROJECT / SHORT PAPERS** **V. Novel Approaches to Landscapes in Cultural Heritage** Chairwoman: Eirini Papageorgiou
15:30 - 16:00	**Coffee Break**
16:00 – 18:30	**FULL / PROJECT PAPERS** **VI. Heritage Building Information Model (HBIM)** Chairmen: Prof. João Martins, Prof. A. Doulamis and Prof. Roberto di Giulio
19:00	**COST TD1406 Official Dinner**

Thursday 3st November 2016 | 10:00 - 10:30 and 11:00-13:00

IV. 3D Reconstruction and Modelling

▪ IMPLEMENTATION AND USAGE SCENARIOS OF A PARTICIPATORY PLATFORM FOR CULTURAL ENVIRONMENTS (Full paper)

Zois Koukopoulos et al.

Abstract:

Raising audience awareness over the creation and evolution of a cultural participatory digital platform is a critical point for its acceptance. The proposed platform adopts user involvement in the content collection level through the implementation of a mobile application easily downloadable to the user's smartphone and the use of a web portal application. Complementary web portal permits the management of the collected content in a trustworthy manner adopting an extended role-based access control model for authorization purposes. Users can formulate private groups to contribute and share content. Platform guarantees the soundness of contributed content through an auditing procedure requested by the contributors and conducted by experts selected randomly. In order to stress the applicability of our platform to various cultural environments, we present a number of usage scenarios targeting various stakeholders from specialists and museum curators to students, teachers and simple enthusiasts aiming in the development of coherent narrations.

▪ BENCHMARKING CLOSE-RANGE STRUCTURE FROM MOTION 3D RECONSTRUCTION SOFTWARE UNDER VARYING CAPTURING CONDITIONS (Full paper)

Ivan Nikolov et al.

Abstract:

Structure from Motion 3D reconstruction has become widely used in recent years in a number of fields such as industrial surface inspection, archeology, cultural heritage preservation and geomapping. A number of software solutions have been released using variations of this technique. In this paper we analyse the state of the art of these software applications, by comparing the resultant 3D meshes qualitatively and quantitatively. We propose a number of testing scenarios using different lighting conditions, camera positions and image acquisition methods for the best in-depth analysis and discuss the results, the overall performance and the problems present in each software. We employ distance and roughness metrics for evaluating the final reconstruction results.

▪ PROPORTIONAL SYSTEMS IN THE DESIGN OF THE CATHEDRAL OF ST. GEORGE OF THE GREEKS, CYPRUS (Full paper)

Douglas Cawthorne et al.

Abstract:

The cathedral of St. George of the Greeks was built in the 14th – 15th c. in Famagusta, Cyprus to

accommodate the religious needs of the Greek orthodox community living under a Frankish aristocracy. Its design is a hybrid of western European and Greek orthodox architectural traditions which reflect the political and social circumstances of its creation. This paper examines the degree to which the underlying design methods employed can be extrapolated from the physical remains of the building, the historical sources bearing upon its interpretation and comparisons with related structures. Results are presented of a recent (2016) photogrammetric survey of the building and a new digital reconstruction of the church derived from it. These are used to quantify, assess and illustrate a three-dimensional armature of regulatory proportions which it is proposed for reasons of ecclesiastical philosophy and practical execution, were employed to shape the building's physical form.

▪ THE RECONSTRUCTION – ARGUMENTATION METHOD. PROPOSAL FOR A MINIMUM STANDARD OF DOCUMENTATION IN THE CONTEXT OF VIRTUAL RECONSTRUCTIONS (Full paper)

Mieke Pfarr-Harfst et al.

Abstract:

Virtual reconstructions exist for around 25 years. A documentation of the process of reconstructions was rarely made – a deficit from a scientific standpoint. One reason was that this was a relatively new discipline and there was a lack of agreement as to standards and methods. Another was that in many cases the client did not provide separate funds for a documentation and also did not require or request them. In the meantime, many involved parties have become aware of the problem of the lack of documentation and standards. Besides good scientific practice, also the guarantee to have access to knowledge embedded in reconstructions should be realized. However, up to now the proposals orientate themselves rather on extensive maximal solutions, often coupled with complex data bank applications, possibly also with annotations to 3D models, which in reality in most projects would present big challenges as far as usability and available resources are concerned. Thus it seemed more constructive to develop a minimal standard, which in practice would be manageable. The goal of the proposal presented is to compare images of the reconstruction with the sources and to link them to a written text (argumentation), which explains upon what basis, including sources, analogies etc. the reconstruction was made. The core is therefore the triad – "Reconstruction – Argumentation – Source". In addition, there exists the possibility to also depict variants for the different areas of a reconstructed building. The advantage of such a documentation method is that it would be theoretically useable for every kind of architectural reconstruction and thus also for haptic models, reconstruction drawings or actually built structures. The technical goal is a web-linked database that can serve as a platform for work, publication and discussion. The method can also be implemented as a simple text document with a series of images.

▪ MULTI-SCALE 3D MODELLING OF DAMAGED CULTURAL SITES: USE CASES AND IMAGE-BASED WORKFLOWS (Full paper)

Styliani Verykokou et al.

Abstract:

The creation of 3D models of Cultural Heritage (CH) sites that have undergone a severe disaster due to a catastrophic incident (e.g., earthquake, explosion, terrorist attack) is of great importance for

several use cases. Different actors, like Urban Search and Rescue crews, structural, civil and surveying engineers, people in charge of restoration plans, archaeologists, architects, reporters, television presenters and computer engineers, may exploit the 3D information in a different way. Hence, each of them needs models of different scales/levels of detail and under different time constraints. In this paper the need for multi-scale 3D models of severely damaged or collapsed CH sites is addressed and various use cases are discussed. Also, image-based workflows are established for creating multi-scale 3D products via UAV images of a damaged church due to an earthquake. The models of different scales require very different amounts of time for their generation and may be used for search and rescue, damage assessment, geometric documentation, planning of repair works and simple visualization.

▪ LOW COST TECHNIQUE FOR ACCURATE GEOMETRIC DOCUMENTATION OF COMPLEX MONUMENTS BY NON-EXPERTS (Full paper)

Charalabos Ioannidis et al.

Abstract:

This paper proposes the technique of stereo-orthoimage for reliable and accurate identification and digitization of complex features of cultural heritage (CH) monuments (e.g., edges, outlines, damages, holes, cracks) in the context of large-scale geometric and damage documentation. It is a low cost technique, which can be implemented by non-experts (architects, archaeologists, etc.). A developed plugin, named OrthoSteroMate (OSM), for the open-source GIS system QGIS that implements the stereo-orthoimage technique is presented. It introduces stereo-orthoimages in GIS environments, as complements to conventional orthoimages, allowing better interpretation of the details of built CH and enabling more accurate digitization, taking advantage of stereoscopic observation when no special equipment or photogrammetric knowledge are needed. The application of the plugin along with QGIS tools for the restitution of two CH monuments were made, yielding satisfying results and proving the applicability of the proposed low-cost method for complex CH documentation.

▪ DEBATE AND CONSIDERATIONS ON USING VIDEOS FOR CULTURAL HERITAGE FROM SOCIAL MEDIA FOR 3D MODELLING (Project paper)

Kyriacos Themistocleous

Abstract:

Social media can be used as a new source of information by archaeologists and cultural heritage experts to access cultural heritage-related videos for creating 3D models using Structure for Motion techniques. There is a vast amount of data now available on social media, which are posted every day on the internet. However, there is confusion regarding if such data is considered fair use, public domain, creative commons or copyrighted. Indeed, social medias, such as Facebook, Twitter, Instagram and YouTube, have different regulations regarding ownership and republishing videos. This paper will discuss how social media can be used for cultural heritage research, especially if video data is used, transformed or repurposed for 3D modelling.

▪ INVESTIGATIONS OF LOW-COST SYSTEMS FOR 3D RECONSTRUCTION OF SMALL OBJECTS (Project paper)

Thomas P. Kersten et al.

Abstract:

In this paper geometric investigations are presented, which demonstrate the potential of the low-cost recording systems DAVID SLS-1 and Microsoft® Kinect for sustainable use in applications for architecture, cultural heritage and archaeology. From the data recorded with DAVID SLS-1 and Microsoft® Kinect 3D models were produced by different programs and these were examined in relation to handling, quality and reliability in further post processing. For the investigations a number of 3D objects with different surface forms, including a test body, were scanned using the structured light system ATOS I 2M from GOM as references. To compare the results of the Kinect and the SLS-1, digital surface models of this test body were automatically generated using image-based low-cost recording systems (Nikon D7000). As a result of these 3D comparisons to the ATOS reference data a standard deviation of 1.5 and/or 1.6 mm was obtained with the structured light system SLS-1 and/or with the Kinect, while with the image-based 3D reconstruction methods of VisualSFM/CMVS a higher standard deviation of up to 0.2 mm was achieved. Although the introduced low-cost structured light system David SLS-1 could not show the geometrical accuracy of a high end system (ATOS I) of approx. 0.04 mm, it is useful for the 3D recording of smaller objects (size up to 50 cm) with a reduced accuracy for several different applications.

▪ DIGITAL 3D RECONSTRUCTED MODELS – STRUCTURING VISUALIZATION PROJECT WORKFLOWS (Project paper)

Mieke Pfarr-Harfst et al.

Abstract:

Cultural Heritage (CH) visualizations have to be understood as a combination of research sources, the contemporary historical and cultural context (Zeitgeist), project background and work process. All available information is collected, consolidated, filtered and assembled into a coherent picture. In case of digital 3D reconstructed models, the result is a digital data set that can be processed for different application fields. They are understood as a result of a complex creative process and as a synthesis of a CH research project, its CH context, the available research source material, and the modeling process itself. For all visualisation types in CH different conditions, factors, and basic rules apply to achieve a high quality result. Two examples are presented illustrating the structured view on visualisation projects as such. This paper seeks to differentiate the various research sources being the basis for digital 3D reconstructed models and defines work phases allowing a quality assessment. Furthermore, the potentials of including this structured view into the ontology COSCH^{KR} currently under development is discussed. In combination with traditional guidelines COSCH^{KR} platform could open up new and flexible approaches.

▪ DEFINITION OF A WORKFLOW FOR WEB BROWSING OF 3D MODELS IN ARCHAEOLOGY (Short paper)

Andrea Scianna et al.

Abstract:

The Cultural Heritage (CH) is a fundamental element of promotion of territories and of tourism development. Publishing 3D models of archaeological sites and their three-dimensional reconstruction on the Web is one of the best ways to spread their knowledge. However, many recent scientific researches in this field have highlighted the limitations and difficulties related to the networking of interactive 3D models. The main difficulties are related to the complexity and the size of models, which influence the access speed, and the cost of software and hardware needed for the publication on the WEB. In light of this background, this article describes the further advances of research activities carried out at GISLAB CNR-UNIPA for creating interactive 3D models of archaeological sites, accessible and navigable with a Web browser, fully compliant with HTML5. This system includes also the surrounding landscape, essential to analyze and understand the close relationship between human settlements and the surrounding geographical contexts. Such models don't need specific app for navigation but are accessible on the WEB via the WebGL open source libraries, compliant with the most popular Web browsers (Firefox, Safari and Chrome). The system consists of a headboard multimedia platform tested on Mokarta archaeological site (Trapani, Sicily). The user can explore the 3D model of the archaeological site in its current state, its virtual reconstruction, and the historical documentation. This application has highlighted the great potential and the limits of the sharing of complex 3D models via the Web, opening new scenarios for the purpose of valorization of the archaeological heritage through the use of effective technologies and reduction of costs, opening new themes of further research. This experimentation is also a real example of an open data application.

▪ 3D MEASUREMENT OF OSTEOLOGICAL REMAINS USING FRINGE PROJECTION (Short paper)

Petros Stavroulakis et al.

Abstract:

In this work, we demonstrate successful 3D digitization of animal and human bone remains using a method called phase shifting fringe projection. An upper incisor tooth of a brown bear, Ursus arctos, found in the UK and a human lumbar vertebra were digitized by combining 3D point clouds acquired at different angles. A single projector and camera were used whilst rotating the sample on a turntable to change the view and acquire the data quickly and efficiently. The 3D point cloud views were overlapped to create a complete 3D representation by aligning the point clouds using an iterative closest point algorithm. Efforts are being made to extend this technique to clay and marble materials. The 'information-rich metrology' approach that is pursued by our group aims to eventually allow 'one-shot' full-object 3D scanning, which will provide the ability for samples to be scanned more rapidly and accurately than before, and enable the convergence of the research areas of informatics, archaeology and cultural preservation.

Thursday 3st November 2016 | 14:00 - 15:30

V. Novel Approaches to Landscapes in Cultural Heritage

▪ OBSERVING LANDSCAPE CHANGES AROUND THE NICOSIA OLD TOWN CENTER USING MULTI-TEMPORAL DATASETS (Project paper)

Branka Cuca et al.

Abstract:

In 1980s a significant boom in construction industry was witnessed in Cyprus. This paper explores the changes of land use that have occurred over the past 30 years around the historical capital of Nicosia, in particular around the core of the historic city defined by the Venetian walls. Further to some Open Geospatial Data available within the national and regional geo-portals, the research has focused on the use and exploitation of freely accessible satellite imagery (such as Landsat and Sentinel imagery) and other archive aerial datasets in order to observe the most recent modifications of the urban landscapes. The changes occurred over time were observed using multi-spectral multi-temporal dataset with main aim to create thematic maps for further interpretation. The changes were hence identified, mapped and structured so as to emphasize different types and density of urban development affecting the surrounding landscapes and potential "hot-spots". Such observations could be a valuable input to the future urban development of Nicosia.

▪ TOWARDS THE SUSTAINABLE DEVELOPMENT OF CULTURAL LANDSCAPES THROUGH TWO CASE STUDIES ON DIFFERENT SCALE (Project paper)

Eirini-Chrysovalantou Papageorgiou

Abstract:

Since the beginning of the twentieth century the definition of Cultural Heritage has gradually expanded from the scale of individual monument to the scale of cultural landscapes. The broadening of the term has at the same time increased the complexity of the information originating from different domains and being on different scales and forms. In this context, the objectives as well as the challenges involved in the Cultural Heritage sector have become highly diversified, often leading to fragmented and less successful interventions which do not conform with the principles of Sustainable Development. Therefore, Cultural Heritage and Sustainable Development should correlate with each another. Pursuing the achievement of sustainable models of development for cultural landscapes, this paper investigates how the factor of scale can act as a linkage between the fields of Cultural Heritage and Sustainable Development.

▪ THE FORTIFICATION SYSTEM OF THE CITY OF URBINO: THE CASE STUDY OF VALBONA GATE FROM 3D SURVEYS TO GIS APPLICATIONS FOR DYNAMIC MAPS (Project paper)

Sara Bertozzi et al.

Abstract:

The city walls of the city of Urbino, originally Metaurense Urvinum, today represent the result of an evolution that has antique origins, from protohistoric settlements to the first Roman ruins, up to its current conformation, expression of the important Renaissance period. We present a study of documentation, survey and analysis of the various parts of the walls, analysed in their entirety and in individual elements, among these we focus on the main access gate to the historic centre, Valbona Gate. The integration of avant-garde technologies during all the phases, from the survey to the graphic rendering, up to advanced management with GIS instruments allows us to have a picture of the architectural reality both of the present and the past, fundamental for scheduled maintenance and for planning future conservation interventions. The geometric and morphological survey brought the process to completion with the problems relating to deterioration, the understanding of the situation of the pathologies and the descriptive dimension of the architectural elements in a complete bi- and tri-dimensional GIS system that allows us to take advantage of a complete series of processing and statistical assessment capabilities. The project is part of a wider program of research on the walled city of Urbino, wherein the analysis of the city walls integrates with the diachronic analysis of its expansion and the geomorphological context in which it is found as well as a 3D City Model and the analysis and management of the built environment, current and archaeological.

▪ COMMUNITY-ORIENTED HERITAGE CONSERVATION USING OPEN-SOURCE INVENTORY SYSTEM – ARCHES-HIP (Full paper)

Jihn-Fa Jan

Abstract:

The objective of this research is to develop a heritage resource inventory and management system for rural communities. The study site consists of three villages in Shoufeng Township located in Hualien County of Taiwan. GPS data logger and smart phones were used to obtain geographic coordinates of various heritage resources including historic buildings and sites, artifacts, events and activities, cultural and natural landscapes. To establish a system for digital heritage inventory and management, we used the Arches-HIP (Heritage Inventory Package), an open source web-based application, to maintain a geospatial database for storing the spatial and temporal information of all heritage resources. The results show that Arches-HIP is a very economic and powerful tool for managing digital heritage resources at different scales. Moreover, the Arches system incorporates international standards of heritage inventory and management, which is very important for creating an interoperable system to facilitate international collaboration on heritage conservation.

▪ GEOLOGICAL HERITAGE AND CONSERVATION: A CASE STUDY OF THE VISUAL AXIS THROUGH DIGITAL TERRAIN MODELING (Short paper)

Pedro Casagrande et al.

Abstract:

The use of GIS tools for monitoring environmental and cultural heritage through digital terrain models and visual axis in order to ensure a local preservation and demonstrate the relevance to conservation. This conservation is to maintain the local as a tourist, cultural and historical place. Since the survey can be done in a digital platform, there is a new possibility to work for the preservation of the cultural and environmental heritage.

▪ A GIS DATABASE OF MONTENEGRIN KATUNS (KUČI MOUNTAIN AND DURMITOR) (Short paper)

Olga Pelcer – Vujačić et al.

Abstract:

A two-year ongoing project (2015-2017) Valorizing the Montenegrin Katuns through sustainable development of agriculture and tourism – KATUN is innovative because of its multidisciplinary and comprehensive approach of all the aspects of the katuns (temporary centre of traditional summer livestock rearing lasting for centuries in the Montenegrin society). The main idea of this project, being implemented by the interdisciplinary research team, is to create a knowledge base for the multipurpose use of the Montenegrin mountain resources, by combining the traditional agriculture with boosting tourism activities and protecting the cultural heritage. Katuns as nuclei of traditional agriculture in mountain areas face many challenges. This uniqueness of Montenegro has to be preserved and revitalized via new opportunities in tourism and other complementary activities (handcraft, trade, culture, services). Dealing with mountain cultural heritage the first step was creating a pertaining database and mapping and GPS positioning of the katuns, and objects of cultural-historical importance in research area, inventorying of the katuns, determining their condition, origin and characteristics and documenting current condition (photo, video, graphic and textual) of the katuns.

▪ FUTURE DEVELOPMENT PLANS FOR CONSERVATION AREAS IN TAIWAN (Short paper)

Tung-Ming Lee et al.

Abstract:

The protection of cultural heritage assets by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) focuses mostly on the authenticity and integrity of such asset in the twenty-first century, the concept of cultural heritage protection focuses on an integrity conservation approach, in which the authenticity and integrity of a conservation area should be examined. This approach should be the key to developing theories on conservation area development in the twenty-first century.

Thursday 3st November 2016 | 16:00 - 18:30

VI. Heritage Building Information Model

▪ IMPLEMENTATION OF SCAN-TO-BIM AND FEM FOR THE DOCUMENTATION AND ANALYSIS OF HERITAGE TIMBER ROOF STRUCTURES (Full paper)

Maarten Bassier et al.

Abstract:

Current heritage analysis applications and documentation techniques for timber roof structures rely on manual measurements to pro-vide the spatial data. Major simplifications are made to document these structures efficiently. However, these simplified geometric models pro-vide less reliable results. Therefore, the need exists for more realistic models. Additionally, the exchangeability of information between varying parties is paramount. Hence, the construction elements should be defined in a Building Information Model (BIM). This allows users to reuse the model, allowing the distribution of information throughout the project. The goal of our research is to create a realistic BIM model of a complex heritage roof structure employing dense point clouds. The comparison of our complex geometric model to a traditional wire-frame model proves that our approach provides more reliable results in terms of geometry and structural behavior. Our work covers the acquisition, the modelling and the structural analysis of timber roof structures.

▪ IMPLEMENTATION ANALYSIS AND DESIGN FOR ENERGY EFFICIENT INTERVENTION ON HERITAGE BUILDINGS *(No presentation due to obligations)*

Elena Gigliarelli et al.

Abstract:

The study focuses on a multi-scale and multi-disciplinary approach, for energy efficient intervention on the historic centre and buildings of a town in southern Italy. The methodology involves the use of numerical simulations and building information modelling for the management optimisation of the analysis and design phases. The energy analyses are carried out with experimental measurements and numerical simulations and are integrated with traditional historical, typological and architectural analyses. The study confirms the optimal behaviour of historic settlement principle against new urbanisation and proposes a series of specific solutions to be implemented on the buildings based on improving energy efficiency and sustainability of interventions, compatibility with the restoration charts and with the historical and microclimate context of reference. The study highlighted a number of limitations still present in the interoperability between software that future research developments will have to overcome in order to improve the practical applicability of the approach.

▪ HISTORIC BIM IN THE CLOUD (Full paper)

Luigi Barazzetti et al.

Abstract:

In this paper, we present a procedure which makes available an accurate historic BIM (HBIM) in the

cloud. Data processing is carried out with a NURBS-based strategy to reduce the size of the final HBIM derived from images and laser scans, providing an accurate and reliable 3D model with limited memory occupation. This guarantees a remote access with PCs and mobile devices connected through a cloud service.

▪ BUILDING INFORMATION MODELLING – A NOVEL PARAMETRIC MODELING APPROACH BASED ON 3D SURVEYS OF HISTORIC ARCHITECTURE (Full paper)

Fabrizio Banfi

Abstract:

Building Information Modelling (BIM) appears to be the best answer to simplify the traditional process of design, construction, management and maintenance. On the other hand, the intricate reality of the built heritage and the growing need to represent the actual geometry using 3D models collide with the new paradigms of complexity and accuracy, opening a novel operative perspective for restoration and conservation. The management of complexity through BIM requires a new management approach focused on the development of improve the environmental impact cost, reduction and increase in productivity and efficiency the Architecture, Engineering and Construction (AEC) Industry. This structure is quantifiable in morphological and typical terms by establishing levels of development and detail (LoDs) and changes of direction (ReversLoDs) to support the different stages of life cycle (LCM). Starting from different experiences in the field of HBIM, this research work proposes a dynamic parametric modelling approach that involves the use of laser scanning, photogrammetric data and advanced modelling for HBIM.

▪ TRAINING SCHOOLS FOR CONSERVATION OF CULTURAL HERITAGE: BETWEEN EXPERTISE, MANAGEMENT AND EDUCATION (Project paper)

Anna Lobovikov-Katz et al. ***(extra presentation, moved from Session-VII)***

Abstract:

Training schools make an important feature of the European research landscape, fostering exchange in frontier research, and building basis for further research and development. How the cross-area, management and educational issues can be effectively put together in training schools, and specifically, for the benefit of a multi- and interdisciplinary field of conservation of cultural built heritage? This paper showcases the experience from the first lessons of the COST (European Cooperation in Science and Technology) Action i2MHB (Innovation in Intelligent Management of Heritage Buildings), to examine and suggest tools useful for further multidisciplinary synergies and networks in this and other frameworks.

▪ DIGITAL TOOLS FOR HERITAGE PRESERVATION AND ENHANCEMENT - THE INTEGRATION OF PROCESSES AND TECHNOLOGIES ON 20TH CENTURY BUILDINGS IN BRAZIL AND INDIA (Project paper)

Luca Rossato

Abstract:

Currently the 20th century architectures are all over the world in danger and under attack: these

buildings (in many cases designed by international renowned professionals) are facing a silent destruction. Day by day they are slowly modified in terms of materials, volumes, colours or even demolished. These architectures are still used for public purposes or as residential buildings but they are usually in bad conditions and their state of materials conservation is quite poor. This on-going research explores in depth the possibility to preserve and valorize modern heritage in Brazil and India by the integration of 3D tools, processes and technologies in order to face the future preservation challenges. Soon after the research process the main topics of the project were evaluated and studied to create the bases for a structured research path. In parallel the case study assessment was able to identify suitable buildings (both in Brazil and India) on the which the chosen topics are now being applied in order to improve the knowledge on the design process and reach a guidelines proposal for the preservation and enhancement of these architectures.

- **FROM INTEGRATED SURVEY TO THE PARAMETRIC MODELING OF DEGRADATIONS. A FEASIBLE WORKFLOW** (Project paper)

Massimiliano Lo Turco et al.

Abstract:

This work fits into an international research field about 3D modeling to evaluate the Building Information Model performance for infographic representation of Cultural Heritage. Modeling an historic building involves the creation of parametric objects library starting by data survey. The primary purpose of the research is the translation of these information into a parametric model, through the definition of a proper methodology. The main focus of the research is the creation of parametric object representing the preservation status of material and building components: some recurring schemes of the traditional representation have been identified, in order to find a methodology that leads to link these data to the HBIM (Historic BIM) model, improving their capabilities.

- **INCEPTION STANDARD FOR HERITAGE BIM MODELS** (Project paper)

Peter Bonsma et al.

Abstract:

The EU Project INCEPTION will create a platform that is able to exchange content according to state-of-the-art available open BIM standards. This INCEPTION open Heritage BIM platform is not only exchanging data according to existing state-of-the-art standards, but it is based on a new Heritage BIM model using Semantic Web technology. This allows applications to retrieve content according to modern query languages like SPARQL and allows user defined 'on-the-fly' extensions of the standard. This paper describes the structure and development of this new Heritage BIM standard. The Heritage BIM standard is developed by several Semantic Web and BIM standardization specialists in combination with top experts in the field of Cultural Heritage, all of them partners within the INCEPTION project.

- **FROM SFM TO SEMANTIC-AWARE BIM OBJECTS OF ARCHITECTURAL ELEMENTS** (Project paper)

Massimiliano Lo Turco et al.

Abstract:

The huge diffusion of Building Information Modeling approaches in the field of architectural design has characterized the research of the last decades; however very little research has been undertaken to explore the advantages and criticalities of BIM methodologies in Cultural Heritage domain. Moreover, the last developments in digital photogrammetry lead to easily generate reliable low cost 3D textured models, that can be used to create semantic-aware objects of reusable library of historical architectural elements. The aim is to test a novel workflow practitioner centered, based on the use of the latest solutions for point cloud managing into BIM.

- **DEVELOPMENT OF KNOWLEDGE MODEL FOR HERITAGE BUILDINGS** (Project paper)

Andrej Tibaut et al.

Abstract:

Development of techniques for digitalisation of cultural heritage objects (i.e. buildings) has resulted in digital repositories (i.e. Europeana) with millions of digitised items. These vast resources response to queries with datasets containing information for completion of user's understanding of historical artefacts. Large amounts of information require efficient knowledge management. In order to digitally manage and understand large volumes of information contained in construction works projects, the paper suggests a knowledge engineering approach with a common knowledge model. The new knowledge model (ontology) for AEC domain is presented and applied as a case study in a real construction project. As a result, a more effective knowledge management throughout the whole lifecycle of AEC projects is expected.

- **A DIGITAL INFRASTRUCTURE FOR MANAGING 3D CULTURAL MONUMENTS: THE 3D-ICONS CASE** (Project paper)

Christodoulos Chamzas

Abstract:

The digitization process of Cultural Heritage has largely included the creation of 3D content. Digital technologies are currently mature and stable and allow to test new forms of data-sharing, increasing the interactivity between data-providers, stakeholders, professionals, domain experts and general public. Mainly in the 3D research field novel approaches attempt to improve data-publication and data-visualization procedures that aim at providing high-resolution models enriched with realistic details and related descriptions. These were the general goals of 3D-ICONS, a three years European Project ended at the beginning of 2015. The project had a twofold aim: providing high quality 3D models to the European Digital Library Europeana, implementing a metadata schema able to record information about the physical three-dimensional artifact or monument and its digital representation. The project, which brought together partners with relevant expertise in 3D modeling and digitization, has produced a collection of around 4.000 3D models processed into a simplified

form in order to be visualized on low end personal computers and on the web. The models range from large and complex architecture and archaeological monuments to small findings giving a wide impression about the potentiality of 3D data-capture, processing and online publication. The need to demonstrate the full richness of the CARARE2 metadata elements, resulted to the development of the 3D Icons portal, a portal which presents data with a geographical mapping. The technical approach of 3D-ICONS was based on the integration of existing tools and methodologies in a complete supply chain of 3D digitization enriched by related media, a metadata schema and IPR considerations. The project focused on creating and providing digital content including simple 3D models, complex architectural monuments, hypothetical representations of alternative reconstructions with significant details and related high resolution images and videos. In some cases, objects belonging to a monument but presently located elsewhere, for example in museums, were re-contextualizes in 3D. The project's activities predominantly consisted of creating new 3D content digitization but also included some existing 3D data, all of which have been converted into formats accessible online. This work, focuses on the implementation of a permanent digital infrastructure aimed at promoting new ways of making available and visualizing 3D content on the web.

▪ ACQUISITION AND PROCESSING EXPERIENCES OF CLOSE RANGE UAV IMAGES FOR THE 3D MODELING OF HERITAGE BUILDINGS (Project paper)

Arnadi Murtiyoso et al.

Abstract:

The use of image-based techniques to document heritage sites has seen a resurgence in recent years with advancements in optical sensors as well as computing power. The rise of UAVs (Unmanned Aerial Vehicles) also complements this technique, by providing the advantage of aerial view over traditional terrestrial image acquisition. Recently UAVs began to become more and more specialized towards specific tasks, 3D modeling and reconstruction being some of them. In this study the use of state of the art UAV dedicated for close range inspection is analysed. Several case studies were performed on historical buildings in Strasbourg, France. Processing was done by utilizing both commercial and open source photogrammetry and SfM (Structure from Motion) solutions. Both the quality of the aerotriangulation and the dense matching were studied. The final objective of this project is to adapt existing terrestrial image acquisition and processing protocols for use by UAVs.

Friday 4th November 2016

TIME	PLENARIES AND SESSIONS
08:30 - 18:30	**REGISTRATIONS AND EXHIBITIONS**
09:00 - 10:00	**KEYNOTE SPEAKER:** **Mr. Jean-Pierre Massué** **A Euro-Med initiative: Proposal to set up "Cultural Heritage Advisors for Civil Protection in emergency situations and Military Authorities in case of conflicts situation"** **Prof. Dr. Mustafa Erdik** **Earthquake Protection of Museum Displays**
10:00 - 10:30	**FULL / SHORT PAPERS** **Intangible Heritage Digital Documentation**
10:00 - 10:30	**FULL / PROJECT / SHORT PAPERS** **VII. Digital Cultural Heritage in Education, Learning and Training** Chairwoman: Vasiliki Nikolakopoulou
10:30 - 11:00	**Coffee Break**
11:00 - 13:00	**PROJECT / SHORT PAPERS** **VII. Digital Cultural Heritage in Education, Learning and Training** Chairman: Georgios Leventis
13:00 - 14:00	**Lunch**
14:00 - 15:30	**FULL / PROJECT / SHORT PAPERS** **VIII. Visualisation, VR and AR and Serious Games** Chairwoman: Margarita Papaefthymiou
15:30 - 16:00	**Coffee Break**
16:00 – 18:30	**JOINT WORKSHOPS on Virtual Reality, Gamification and Cultural Heritage** **&** **3rd International Workshop on 3D Research Challenges in Cultural Heritage**
19:00	**Free**

Friday 4th November 2016 | 10:00 - 10:30

Intangible Heritage Digital Documentation

▪ PARAMETERIZING THE GEOMETRY AND VISUALIZING THE LIGHTING METHOD OF BYZANTINE CHURCH DOMES (Full paper)

Wassim Jabi et al.

Abstract:

This paper introduces a computer-based tool for the analysis of the geometry and the daylighting of Byzantine church domes to facilitate experimentation with a number of cases before any fieldwork is undertaken. Starting with a geometric derivation of the relationship between dome parameters, the digital tool builds an interactive three-dimensional model of a Byzantine church dome. The model allows the user to input the properties of the dome, the drum, any windows, and the slope of their sills. The model allows the user to define the dome using three different curvatures since such a case was identified in a Mistras church. A custom ray-tracing algorithm visualizes the path of light rays falling on the windowsills and their reflections within the dome. It was found that several parameters are interrelated and that an optimal set of proportions must be established to achieve the expected behavior of light within the dome.

▪ DIGITAL AND HANDCRAFTING PROCESSES APPLIED TO SOUND-STUDIES OF ARCHAEOLOGICAL BONE FLUTES (Full paper)

Etienne Safa et al.

Abstract:

Bone flutes make use of a naturally hollow raw-material. As nature does not produce duplicates, each bone has its own inner cavity, and thus its own sound-potential. This morphological variation implies acoustical specificities, thus making it impossible to handcraft a true and exact sound-replica in another bone. This phenomenon has been observed in a handcrafting context and has led us to conduct two series of experiments (the first-one using handcrafting process, the second-one using 3D process) in order to investigate its exact inuence on acoustics as well as on sound-interpretation based on replicas. The comparison of the results has shed light upon epistemological and methodological issues that have yet to be fully understood. This work contributes to assessing the application of digitization, 3D printing and handcrafting to flute-like sound instruments studied in the field of archaeomusicology.

▪ THE EUROPEANA SOUNDS MUSIC INFORMATION RETRIEVAL PILOT (Short paper)

Alexander Schindler et al.

Abstract:

This paper describes the realization of a Music Information Retrieval (MIR) pilot for a huge audio corpora of European cultural sound heritage, which was developed as part of the Europeana Sounds

project. The demonstrator aimed at evaluating the applicability of technologies deriving from the MIR domain to content provided by various European digital libraries and audio archives. To approach this aim, a query-by-example functionality was implemented using audio-content based similarity search. The development was preceded by an elaborated evaluation of the Europeana Sounds collection to assess appropriate combinations of music content descriptors that are capable to effectively discriminate the various types of audio-content provided within the dataset. The MIR-pilot was evaluated both by using an automatic and a user based evaluation. The results showed that the quality of the implemented query-by-example algorithm is comparable to state-of-the-art music similarity approaches reported in literature.

▪ **EXPLOITING AGRICULTURE AS AN INTANGIBLE CULTURAL HERITAGE: THE CASE OF THE FARFALLA PROJECT** (Short paper)

Alessandro Pozzebon et al.

Abstract:

This paper describes the methodological background and the first results of the “Farfalla” project, a research project financed by the Tuscany Region, Italy, focusing on the promotion of historical agricultural production through an holistic approach bringing together different disciplines, from archaeology and genetics to information engineering. The “Farfalla” project aims at rediscovering historical agricultural techniques and productions through the study of historical testimonies and archaeological sites, combined with genetic and botanic analyses, to exploit them through modern agronomic techniques, and to promote them with new generation ICT technologies focusing on their high value in terms of biodiversity and cultural significance.

Friday 4th November 2016 | 10:00 - 10:30 and 11:00-13:00

VII. Digital Cultural Heritage in Education, Learning and Training

▪ "HUMAN" TECHNOLOGY IN THE DIGITAL ERA: FREEHAND IMAGES AND ANALYSIS OF CULTURAL HERITAGE – THE KNOW-HOW AND ITS APPLICATIONS (Full paper)

Anna Lobovikov-Katz

Abstract:

Rapidly developing advanced methods and techniques often displace the traditional ones. But might such "traditional" perception of the "old" as hopelessly outdated cause us to overlook its intrinsic qualities? Could a relevance for actual disadvantages be suggested, could a traditionally time-consuming technology be transformed into an effective one, with its original values preserved? This paper reconsiders the role of freehand sketching in modern conservation of cultural heritage by shifting the main focus from the result to the process. It presents a method, combined with the rapid learning methodology for achieving this traditional artistic ability, and examines its focused application to the visual analysis of cultural heritage by non-artist users. This paper demonstrates its wide accessibility to the general public and conservation experts, and examines its uses in modern multi-and interdisciplinary conservation of built heritage through recent results of the application of the method in national and international projects.

▪ ADULT AND CHILDREN USER EXPERIENCE WITH LEAP MOTION IN DIGITAL HERITAGE: THE CYCLADIC SCULPTURE APPLICATION (Full paper)

Panayiotis Koutsabasis et al.

Abstract:

Recent advances in low-cost sensor technologies, such as Microsoft Kinect and Leap Motion allow kinaesthetic interactions with interactive 3D applications. Museums and heritage institutions can significantly benefit from kinaesthetic applications that provide a more experiential approach for learning about cultural heritage; however detailed evaluations of the user experience are still scarce. This paper presents the development and user-centred evaluation of a cultural heritage application about sculpturing Cycladic figurines, which places users in the role of an ancient craftsman or sculptor who progressively creates a statue by selecting and applying the appropriate tools with bare-hand interactions tracked by the Leap Motion sensor. The evaluation of the user experience of ten adults and ten children in two subsequent studies reveals that users find the experience very positive and engaging but usability and tracking issues remain. We identify these issues and propose design guidelines to address them.

- **RESEARCHING KNOWLEDGE CONCERNS IN VIRTUAL HISTORICAL ARCHITECTURE** (Full paper)

Sander Münster et al.

Abstract:

3D reconstructions have always been an important medium for teaching, illustrating and researching historical facts and items, especially architecture. Virtual representation is often created by cross-disciplinary workgroups, addressing a wide and heterogeneous audience. The authors investigated knowledge-related phenomena in four stages, using qualitative and quantitative research methods. The first stage focuses on the scope and overall relevance of virtual architecture within the field of digital heritage, and the second investigates phenomena related to the creation of virtual architectural representations. A third stage examines how skills and competencies for creating virtual architectural representations evolve during a project and whether teaching facilitates their development. Finally, a fourth stage evaluates how to design virtual building representations to make them comprehensible to a lay audience.

- **CONTEXTUALIZING 3D CULTURAL HERITAGE** (Project paper)

James Lloyd

Abstract:

An increasing number of cultural heritage 3D models are being made public via the 3D-party platform, 'Sketchfab'. This is a hugely popular way to share cultural heritage with a wide audience. The British Museum's model of the Granite head of Amenemhat III has been viewed online 61,500 times and downloaded 3,000 times (as of writing). This paper will explore Ancient History Encyclopedia's project to include 3D models on their website, and how doing so helps contextualize an object, creating a deeper learning experience for the reader of our content and the viewer of a model.

- **CROWDSOURCING CULTURAL HERITAGE: FROM 3D MODELING TO THE ENGAGEMENT OF YOUNG GENERATIONS** (Project paper)

Laura Inzerillo et al.

Abstract:

Monitoring, digitizing and archiving museum artworks represent an important socio-cultural accomplishment and an overcoming in digital preservation today. Cultural heritage is constantly under threat of terrorist attacks and natural disaster. The high costs related to documentation task have prevented a constantly and massive survey activity. The low cost 3D image based acquisition and elaboration techniques of an object, allow to carry out a 3D photorealistic model in a short time. Therefore, a lot of museum adopted these techniques for the artworks archiving. Crowdsourcing activities can significantly speed up survey and elaboration procedures. If, on the one hand, these initiatives can have a positive impact, on the other hand involve the online user with a marginal role. In this paper we demonstrate how it is appropriate thinking the museum visitor as "museum operator/maker" of the digital model overstepping the outcomes achieved so far.

- **EDUCATIONAL CREATIVE USE AND REUSE OF DIGITAL CULTURAL HERITAGE DATA FOR CYPRIOT UNESCO MONUMENTS** (Project paper)

Marinos Ioannides et al.

Abstract:

Nowadays, there is a rising demand of reusing the constantly enriched information from heritage digitalization in different ways. One of the objectives of the EU Europeana Space project is the development of a holistic approach for educating people (grown-ups and kids) on Monuments that are listed at UNESCO world heritage list, in Cyprus. The proposed model action is based on the cross cultural approach which, at the same time, responds to the contemporary pedagogical and methodological directions. The system uses innovative digital heritage resources to help the user learn about the different phases of the monument, the history, the architectural value and the conservation stage. The result is a responsive educational platform, where every Monument is a different course and every course is addressed to different age groups. Moreover, part of our future work is the evaluation of the platform by particular groups of our target users.

- **TIME-TRAVELLING WITH MOBILE AUGMENTED REALITY: A CASE STUDY ON THE PIAZZA DEI MIRACOLI** (Project paper)

Mihai Duguleana et al.

Abstract:

This paper presents a new application in the field of cultural heritage, allowing outdoor site exploration throughout different periods of time, based on Mobile Augmented Reality (MAR) technology. The purpose of this research is to allow a free interaction metaphor between users and heritage landmarks, and to enrich their travel experience with important historic facts. We use Metaio SDK to implement this concept within an Android application. We take the specific case of the Leaning Tower of Pisa, the Cathedral and the Baptistery, all key landmarks from Piazza dei Miracoli in Pisa, to prove the usefulness of this paradigm. Five epochs are presented within the application, together with key data about each of them. We assess the usability and engagement of this application by conducting a study with 15 users. The results obtained from the user evaluation show that the concept is not only valid, but also attracting to most of the people. The findings suggest that this kind of applications may attract more visitors while also enhancing their visiting experience.

- **ESTABLISHING A REMOTE SENSING SCIENCE CENTER IN CYPRUS: FIRST YEAR OF ACTIVITIES OF ATHENA PROJECT** (Short paper)

Diofantos Hadjimitsis et al.

Abstract:

ATHENA H2020 Twinning project is a three-year duration project and its main objective is to strengthen the Cyprus University of Technology (CUT) Remote Sensing Science and Geo-Environment Research Laboratory in the field of “Remote Sensing Archaeology” by creating a unique link between two internationally-leading research institutions: National Research Council of Italy (CNR) and the German Aerospace Centre (DLR). Through the ATHENA project, CUT’s staff research profile and expertise will be raised while S&T capacity of the linked institutions will be enhanced. In this paper the abovementioned objectives are presented through the various activities accomplished in the first year of the project. These activities include both virtual training by experts in topics such as active remote sensing sensors and sophisticated algorithms, as well as scientific workshops dedicated to specific earth observation and cultural heritage aspects. During this first year,

outreached activities have been also performed aiming to promote remote sensing and other non-destructive techniques, including geophysics, for monitoring and safeguarding archaeological heritage of Cyprus. The ATHENA center aims to serve the local community of Cyprus, but at the same time to be established in the wider area of eastern Mediterranean.

Friday 4th November 2016 | 14:00 - 15:30

VIII. Visualisation, VR and AR and Serious Games

▪ A MOBILE, AR INSIDE-OUT POSITIONAL TRACKING ALGORITHM, (MARIOPOT), SUITABLE FOR MODERN, AFFORDABLE CARDBOARD-STYLE VR HMDS (Full paper)

Paul Zikas et al.

Abstract:

Smartphone devices constitute a low-cost, mainstream and easy to use h/w for VR rendering and main component for modern, mobile VR Head-Mounted-Displays (HMDs). They support rotational tracking from on board sensors to manage orientation changes, via their Inertial Measurement Units (IMUs), but they lack positional tracking to reflect head translational movements, a key feature that modern, desktop VR HMDs nowadays provide out-of-the-box. Taking advantage of the RGB camera sensor that each modern mobile device is equipped, we describe a novel combination of inside-out AR tracking algorithms based on both marker and markerless tracking systems to provide the missing positional tracking for mobile HMDs. We employed this system as an affordable, low-cost VR visualization h/w and s/w method, for heritage professionals to employ it for VR archeological sites and Cultural Heritage related monuments interactive walk-throughs. We also compared our results with a recent holographic AR headset (Meta AR-glasses) that supports gesture recognition and interaction with the virtual objects via its RGB-D camera sensor and integrated IMU.

▪ VIRTUAL AND AUGMENTED REALITY TOOLS TO IMPROVE THE EXPLOITATION OF UNDERWATER ARCHAEOLOGICAL SITES BY DIVER AND NON-DIVER TOURISTS (Full paper)

Fabio Bruno et al.

Abstract:

The underwater cultural heritage is an immeasurable archaeological and historical resource with huge, but yet largely unexploited, potentials for the maritime and coastal tourism. In this regard, in the last years, national and international government authorities are supporting and strengthening research activities and development strategies, plans and policies to realize a more sustainable, responsible and accessible exploitation of the underwater cultural heritage. To this end, the paper presents the architecture of a new system that, taking advantage of the modern virtual and augmented reality technologies, allows diver and non-diver tourists to make a more engaging and educational experience of the underwater archaeological sites. This system has been developed and tested in the VISAS project (www.visas-project.eu) that aims to the enhancement of the cultural and tourist offer related to the underwater archaeology through innovation of modes of experience, both on site and remote, of the underwater environments of archaeological interest.

- **INTERACTING WITH SIMULATED ARCHAEOLOGICAL ASSETS** (Full paper)

Arian Goren et al

Abstract:

Digital and 3D data are common components in current archaeological work, and expectations regarding their utilization in contextualizing archaeological knowledge are steadily on the rise. The rapid progress in real-time rendering software and more accessible computational power enables integrated data-sets to (re)gain relevance in the process of interpreting archaeological contexts. Retaining high level of details and correct geometric relations of a complex scene while reconciling inherent variations in the scale, format, and resolution of input data (including 2D legacy data and 3D field recordings) has been already successfully achieved in the simulation of the Temple of the Storm God of Aleppo, realized by an interdisciplinary working group in the HTW Berlin. The current paper addresses the modification of virtual and immersive environments within the field of cultural heritage, and evaluating their potential as tools in interpretative archaeological processes. Based on widely available game technology, two applications are presented, supporting real-time interaction and collaborative work within a single modeled space.

- **VIRTUAL RECONSTRUCTION 3.0: NEW APPROACH OF WEB-BASED VISUALISATION AND DOCUMENTATION OF LOST CULTURAL HERITAGE** (Full paper)

Daniel Dworak et al.

Abstract:

The paper presents the project entitled "Virtual Reconstructions in Transnational Research Environments the Portal: 'Palaces and Parks in former East Prussia'" in the light of the SemanticWeb and Open Source technologies. The researches are focused on certification, classification, annotation, storage and visualisation of 3D data sets, proposing methodology of the computer-based 3D computer reconstruction of Cultural Heritage, which are still lacking. The multinational and interdisciplinary project with interactive 3D models being part of a semantic data model, is concerned with designing a Virtual Research Environment. Our approach affects the entire process of digital 3D reconstruction with the development of an XML schema called Cultural Heritage Markup Language as a groundwork for an application ontology. The results bring new insights into areas such as effective data acquisition, documentation, semantic 3D modelling and visualisation and data management. They may be useful for the creation of Virtual Environments and other forms of Cultural Heritage's interactive presentation that employ open source visualisations standards (e.g. WebGL technology). An aspect that needs to be improved concerns coding and uploading large 3D data sets using alternative formats, with an emphasis on art and architectural models. We have developed a technique for coding, long-term storing and decoding 3D geometrical data in 2D PNG files, which are characterised by small size and lossless compression.

▪ 'TRANSLATION' AND FRUITION OF AN ANCIENT BOOK THROUGH VIRTUAL REALITY IN THE CASE OF LOST CULTURAL HERITAGE. CASE STUDY: "INSCRIPTIONES" BY EMMANUEL THESAURUS (Project paper)

Sanaz Davardoust et al.

Abstract:

This article presents a methodology for historical information fruition, such as ancient books texts, in the tourism field. The case study highlights the great possibility that virtual reality (VR) offers to Cultural Heritage professionals in terms of communication and awareness raising of end users. This methodology, applied to the rare 17th century book by Emmanuel Thesaurus "*Inscriptiones quotquot reperiri potuerunt Opera ed diligentia Emmanuelis Philiberti Panealbi*", allows us to show the lost seventeenth-century traits of the Marble Hall in Palazzo di Città (Turin). Tourists can be immersed in a virtual space based on the words of the ancient book within the real space of the Hall, which let him relive the early baroque project atmosphere. Through this work, it is possible to show how the use of cutting-edge ICT, such as BIM, can impact both on research and society, by arousing the public interest for Cultural Heritage and shared understanding.

▪ AN INTERDISCIPLINARY STUDY ON THE ANCIENT EGYPTIAN WINES: THE EGYWINE PROJECT (Project paper)

Maria Rosa Guasch-Jané

Abstract:

This article presents the research results of the 'Irep en Kemet' Project that studies the Ancient Egyptian wine culture and the newly developed website of the research project [www.wineofancientegypt.com] to transfer the knowledge and disseminate the results. For the first time, the corpus of the viticulture and winemaking scenes in the ancient Egyptian private tombs has been developed, together with the bibliographical and scene-detail databases. The second phase of the 'Irep en Kemet' website includes an interactive archaeological map of Egypt with the viticulture and winemaking scenes, and also the databases and the results of the research. Moreover, the objectives and preliminary results of the EGYWINE project that investigates the wine jars and wine inscriptions, and the ancient DNA of the Egyptian wines, are presented.

▪ PROJECT IMARECULTURE: ADVANCED VR, IMMERSIVE SERIOUS GAMES AND AUGMENTED REALITY AS TOOLS TO RAISE AWARENESS AND ACCESS TO EUROPEAN UNDERWATER CULTURAL HERITAGE (Project paper)

Dimitrios Skarlatos et al.

Abstract:

The project iMARECULTURE is focusing in raising European identity awareness using maritime and underwater cultural interaction and exchange in Mediterranean Sea. Commercial ship routes joining Europe with other cultures are vivid examples of cultural interaction, while shipwrecks and submerged sites, unreachable to wide public are excellent samples that can benefit from immersive technologies, augmented and virtual reality. The projects aim to bring inherently unreachable

underwater cultural heritage within digital reach of the wide public using virtual visits and immersive technologies. Apart from reusing existing 3D data of underwater shipwrecks and sites, with respect to ethics, rights and licensing, to provide a personalized dry visit to a museum visitor or augmented reality to the diver, it also emphasizes on developing pre- and after- encounter of the digital or physical museum visitor. The former one is implemented exploiting geospatial enabled technologies for developing a serious game of sailing over ancient Mediterranean and the latter for an underwater shipwreck excavation game. Both games are realized thought social media, in order to facilitate information exchange among users. The project supports dry visits providing immersive experience through VR Cave and 3D info kiosks on museums or through the web. Additionally, aims to significantly enhance the experience of the diver, visitor or scholar, using underwater augmented reality in a tablet and an underwater housing. The consortium is composed by universities and SMEs with experience in diverse underwater projects, existing digital libraries, and people many of which are divers themselves.

- **ARCHAEOINSIDE: MULTIMODAL VISUALIZATION OF AUGMENTED REALITY AND INTERACTION WITH ARCHAEOLOGICAL ARTIFACTS** (Project paper)

Kadar Manuella et al.

Abstract:

This paper reports on a system named ArchaeoInside designed in order to offer a virtual environment for archaeological exploration with large access to public, researchers and museum curators. ArchaeoInside project aims at recording, classifying, digitizing, accessing and presenting archaeological sites and artifacts in Augmented Reality.

- **DICE: DIGITAL IMMERSIVE CULTURAL ENVIRONMENT** (Project paper)

Stelios C.A Thomopoulos et al.

Abstract:

A Digital Immersive Cultural Environment (DICE) consists of a VR/AR (virtual & augmented reality) platform, a CMS (Content Management System) and a GIS (Geographic Information System) for geo-referencing both space and content and for providing immersive navigation in the VR/AR space. Such a platform offers 3D reconstruction of space, geo-coding of the virtual space in actual geographic coordinates and overlay capabilities with real georeferenced space. The coupling of a CMS with a GIS associates information and data with the geographic coordinates of the VR/AR space, thus making available content on demand in accordance to spatial point of interest within the VR/AR space and immersive navigation in both VR and AR spaces. Incorporation of simulation platforms, localization technologies, motion tracking technologies and VR UI's, creates a fully interactive immersive VR/AR ecosystem, beyond the state of the art, with augmented capabilities in education, training, entertainment, content creation, etc.

- **IMMERSIVITY AND PLAYABILITY EVALUATION OF A GAME EXPERIENCE IN CULTURAL HERITAGE** (Project paper)

Roberto Andreoli et al.

Abstract:

The introduction in the market of head-mounted displays (HDMs), originally used for gaming, opens the door to a wide set of application fields that could benefit of characteristics, such as immersivity, presence as well as a high degree of realism. In the field of Cultural Heritage, an immersive virtual experience can enhance playfulness and involvement in the fruition of a cultural experience, by determining a more efficient knowledge absorption and retention of the learnt content. In this work we introduce a prototype of a Serious Game in Cultural Heritage, named HippocraticaCivitasGame, designed and implemented to foster playfulness and learning effectiveness. We also performed an evaluation study to assess users' perceived immersivity and playability, as well as the effectiveness when analyzing the acquired knowledge about the archaeological site structure and the proposed learning goal.

- **TIROLCRAFT: THE QUEST OF CHILDREN TO PLAYING THE ROLE OF PLANNERS AT A HERITAGE PROTECTED TOWN** (Project paper)

Bruno Amaral de Andrade et al.

Abstract:

The main goal of the article is to explore the potential of Minecraft as a platform to engage children into participatory planning. The game enables the players to easily design using blocks to build structures like houses, playgrounds, lakes, vegetation, agriculture, etc. The area of study is a town called Tirol, a heritage protected settlement built by austrian immigrants in the municipality of Santa Leopoldina, State of Espírito Santo, Brazil. This article advances on the state of the art by articulating the potential of Minecraft as a game-based learning into urban participatory planning with children as protagonists actors of rethinking the city. Also, the game enables children to design appropriating themselves on the concept of “child-friendly city” and discussing their design ideas with each other collaboratively. The results indicate that children can learn and work on a playful way to collaborate on urban planning processes, and widens open new researches possibilities.

- **PERVASIVE GAME UTILIZING WIFI FINGERPRINTING-BASED LOCALIZATION** (Project paper)

Filip Maly et al.

Abstract:

The ability to find out a geographical position of a user is one of the unique features of today's mobile devices. The aim of this work is to suggest and implement a pervasive game for the Android operating system which will utilize two methods of the localization of the mobile device simultaneously. The application should guide the user through historical sites and other places of interest in the town. It could increase their attendance as well. The combination of the two ways of the localization will allow us to achieve two goals. First, to verify if the user is really located at the given place (i.e. that he/she did not mock his/her position via Developer Options at the Android

system). Second, to create and update our own database of WiFi fingerprints usable for faster WiFi-based localization.

- **EXPERIENCING CULTURAL HERITAGE SITES USING 3D MODELING FOR THE VISUALLY IMPAIRED** (Short paper)

Kyriacos Themistocleous et al.

Abstract:

There is a need to make cultural heritage sites accessible to all individuals, including those who are visually impaired. 3D printing technology provides the capability to print models of cultural heritage structure as teaching tools for the visually impaired. As well, Unmanned Aerial Vehicles (UAVs) have undergone significant advances in equipment capabilities and now have the ability to obtain high resolution images in a cost effective and efficient manner in order to create 3D models for 3D printing. This paper explores the use of UAVs to acquire high resolution images to generate 3D models that are printed using low-cost 3D printers intended to serve as a teaching aid for the visually impaired. A case study is presented for the Curium archaeological site.

- **MULTIMEDIA INTERACTIVE MAP FOR CH PRESENTATION** (Short paper)

Nicola Maiellaro et al.

Abstract:

This article describes a novel Internet-based cultural heritage (CH) application, a multimedia interactive map with various user-friendly functions that allow users to find results according to their needs. Usually, the user selects a Point of Interest (PoI) to navigate a map, selecting it from a list or through a search function, as illustrated in the four cases studied here. The developed application allows the user to select a PoI and also view the previews of its multimedia contents (using the 'Folder', 'Tile' and 'Table' functions). Moreover, filtering functions—such as century (using the time slider), period, physical accessibility level and multimedia type (using the filter panel)—improve the system usability. Finally, PoIs are visualised on the map with multi-shape markers using a set of colours unambiguous to both colour-blind and non-colour-blind people. The interface is illustrated using data acquired from the Municipality of Cetinje (Montenegro). The software components are also illustrated, which contain useful information to other developers.

- **DIFFERENCES OF FIELD DEPENDENT/INDEPENDENT GAMERS ON CULTURAL HERITAGE PLAYING: PRELIMINARY FINDINGS OF AN EYE-TRACKING STUDY** (Short paper)

George E. Raptis et al.

Abstract:

Based on a large number of different cognitive theories on information processing procedure, suggesting that individuals have different approaches in the way they forage, retrieve, process, store and recall information, this paper investigates the effect of field dependence/independence with regards to visual attention of gamers in the context of a cultural heritage game. Gaze data were collected and analysed from fourteen participants, who were classified as field dependent or

independent according to Group Embedded Figures Test (GEFT), a cognitive style elicitation instrument. The collected data were analysed quantitatively to examine visual attention in terms of fixation count and fixation impact. The results revealed statistically significant differences in both fixation count and fixation impact towards interactive game elements. Statistically significant differences were also measured for specific types of game elements. Findings are expected to provide insights for designers and researchers aiming to design more user-centric cultural heritage games.

▪ **INTERACTIVE SCALABLE VISUALIZATIONS OF CULTURAL HERITAGE FOR DISTANCE ACCESS** (Short paper)

Sven Ubik et al.

Abstract:

Digitization of cultural heritage artefacts is now common. Creation of 3D models by various techniques is widespread. However, most spatial (3D) objects are still represented by photographs in portals such as Europeana. There is a significant potential of using 3D models for education, research, scientific collaboration and popularization. We describe a web-based application that allows scalable visualizations of 3D models ranging from mobile devices to large LCD walls in classrooms and laboratories. Synchronized simultaneous access over a network enables distance learning and collaboration using such models.

Saturday 5th November 2016

TIME	PLENARIES AND SESSIONS
08:30 - 18:30	**REGISTRATIONS AND EXHIBITIONS**
09:00 - 09:30	**KEYNOTE SPEAKER:** **Prof. Dr. Gunnar Liestøl** **Beyond Pokémon GO. Storytelling, Mobile Augmented Reality and Cultural Heritage**
09:30 - 10:30	**FULL / PROJECT / SHORT PAPERS** **IX. Non Destructive Techniques and Digital Applications for Materials' Preservation and Conservation in Cultural Heritage** Chairman: Theodoros Ganetsos
10:30 - 11:00	**Coffee Break**
11:00 - 13:00	**PROJECT / SHORT PAPERS** **IX. Non Destructive Techniques and Digital Applications for Materials' Preservation and Conservation in Cultural Heritage** Chairman: Theodoros Ganetsos
13:00 - 14:00	**Lunch**
14:00 - 15:30	**Closing Ceremony**

Saturday 5th November 2016 | 9:30 - 10:30 and 11:00-13:00

IX. Non Destructive Techniques and Digital Applications for Materials' Preservation and Conservation in Cultural Heritage

▪ RECOVERING HISTORICAL FILM FOOTAGE BY PROCESSING MICROTOMOGRAPHIC IMAGES (Full paper)

Chang Liu et al.

Abstract:

1960s film was typically printed on tri-acetate film base. If not preserved properly, such material breaks down at a chemical level, which is a non-stoppable process that permanently fuses the film so that it essentially becomes a lump of solid plastic. Recently, some precious films, such as the only known copy of the earliest surviving episode of `The Morecambe and Wise Show' have been discovered, but they are in poor condition. They will eventually turn into a pool of sticky liquid and be gone forever. In this paper, as proof of concept, we use X-ray microtomography to provide 3D imaging of a test film of similar vintage, and propose an automatic method to extract footage from it.

▪ A STUDY OF 3D DIGITAL SIMULATION ANALYSIS OF FIRE CHARRING DEGREE OF WOOD CONSTRUCTION OF CHINESE TRADITIONAL ARCHITECTURE (Full paper)

Tsung Chiang Wu

Abstract:

For the Chinese traditional architecture which uses wood construction in large quantities, the fire often causes irreversible disasters, and the cultural heritage may be lost in a flash. According to Taiwan Cultural Assets Preservation Act, the historic monuments restoration must uphold the spirit of "Restoring the Old as the Old", so the structural safety assessment is a necessary program for what can be restored after disaster. Traditionally, the char depth data of the wood construction after fires are obtained by pore-drilling measurement. Therefore, the detection positions and quantity are determined according to the post-disaster condition. The weak structure often fails to be measured, so that the evaluation result is likely to be distorted. This study uses dynamic fire simulation theory, and takes a Chinese traditional architecture, Potzu Pei-tian Temple in Chiayi, Taiwan as an example for experiment, trying to build a digital char depth virtual detection model. The research findings show that this conception can build a virtual detection mode, which may provide more comprehensive char depth information than traditional method, assisting the safety assessment operation of post-disaster restored structures effectively.

▪ MULTI-SPECTRAL IMAGING SYSTEM (IWN) FOR THE DIGITIZATION AND INVESTIGATION OF CULTURAL HERITAGE (Full paper)

Ibrahim El-Rifai et al.

Abstract:

This research focuses on the digitization and investigation of cultural heritage liaised with the practical requirements of conservators and museum curators. Different types of information are extracted about the physical characteristics of the artifacts, pigments preliminary identification and pigments distribution in addition to the colorimetric information. In this regard, a multi-spectral digitization system – named as "iwn" was developed to collect the required information from the cultural heritage objects. The system is portable, customizable, easy to use, in-situ, non-invasive and relatively not expensive. This paper will describe the specifications of the system showing its functions and capabilities through few case studies.

▪ DIAGNOSTIC ACTIVITIES FOR THE PLANNED AND PREVENTIVE CONSERVATION OF MOSAIC PAVEMENTS: THE CASE STUDY OF THE TRICLINIUM OF THE VILLA ROMANA DEL CASALE (SICILY) (Full paper)

Antonella Versaci et al.

Abstract:

The Villa Romana del Casale at Piazza Armerina, Sicily is known for the richness of the mosaic pavements that decorate almost every room. They are the finest mosaics from the Roman world and, even because of their exceptional extent, the Villa was declared a UNESCO World Heritage site in 1997. Their in situ conservation advocated by Cesare Brandi in the late 1950s, an exception to the typical treatment of excavated mosaics of the time, requires a regular monitoring of the physical condition and the establishment of mitigation strategies, however, difficult to implement especially for economic and technical reasons. In this sense, this paper intends to propose an innovative and user-friendly procedure based on laser scanning and thermo-hygrometric investigations able to assess the tessellatum status through time and to evaluate the maintenance work's efficiency, which could be included in a long-term and sustainable approach to preserving our ancient mosaic heritage.

▪ EVOLUTION OF BUILDING MATERIALS AND PHILOSOPHY IN CONSTRUCTION: A PROCESS OF DIGITALIZATION AND VISUALIZATION OF THE ACCUMULATED KNOWLEDGE (Full paper)

Ioanna Papayianni et al.

Abstract:

The long-term research on the constructional materials and techniques of monuments and historic buildings, allowed the accumulation of significant knowledge which could be further disseminated. The masons of antiquity followed principles in designing and building, established by their intuition and experience. The selection of raw materials, the way they upgraded them in constructing foundations, walls, domes, is still remarkable. In the paper, a process of using digital technology

tools for making knowledge acquisition attractive is presented. By developing a specific platform, all relevant scientific knowledge can be sorted, while with a series of digital applications, the diachronic principles of construction, the ancient technology and the achievements of the past can be exploited in a friendly and interactive environment. By this way it is expected that the values of building philosophy in the context of safety, sustainability and economy will be forwarded to new generations.

▪ PIGMENTS IDENTIFICATION USING RAMAN SPECTROSCOPY OF THE 16TH CENTURY PRINTED BOOK "OSORIO" (Project paper)

Igor Lukačević et al.

Abstract:

Croatia has possessed books continuously since the Middle Age. One of the most beautiful examples of the 16th century Prandau-Normann collection is the description of the reign of the King of Portugal Emanuel (1st) has been written by Hieronymus Osorio − Hieronymi Osorii Lvsitani Silvensis in Algarbiis episcope, printed in the printing house of Arnold Birckmann, one of the three most famous Middle Age printers in Köln. Dr. Igor Lukačević, in his experimental work [1] showed that a pigment palette is a common one for the period between 16th and 19th century. Three complementary, non-invasive spectroscopic techniques were used: micro-Raman spectroscopy, PIXE spectroscopy and UV-VIS FORS spectroscopy. Several pigments were identified, like vermilion or cinnabar and minium, white lead and massicot. However, pigments from blue, light blue and green coloured regions could not be determined uniquely, leaving the authors' palette incomplete. Fluorescence, coming from the usage of the Ar+ laser, was the main negative factor during the Raman experiments. For some of the pigments, it was so intense that it covered all of the pigments spectral lines. Dr. Theodore Ganetsos, during his visit in Croatia, used a portable Raman Spectrometer (laser 785nm) [2,3], which would not induce such fluorescence and, consequently, more Raman lines are presented, making the pigment identification more definite and authors' palette complete. We identified ponsjakite to the dark blue area, from the results of PIXE and the Raman peaks.

▪ DESIGN AND APPLICATION OF A DATA SYSTEM FOR THE COMPARATIVE STUDY OF HISTORIC MORTARS (Project paper)

Vasiliki Pachta et al.

Abstract:

Mortars are among the first building materials used in constructions and have played a significant role in building technology's evolution. A large number of mortar samples were systematically analyzed, leading to the need of a flexible data system in order to evaluate and comparatively study all results. This system allowed recording and classifying the data input (physico-mechanical, chemical characteristics), according to the mortar type (structural, renders-plasters, mosaic-mural substrates). With a specific toolbox all information could be easily sorted and comparatively - statistically evaluated, while the data input could be updated for future needs. The basic goal of the data system was to manage the information regarding historic mortars, but throughout its use it seems that a lot of other parameters could be also envisaged. It could therefore become a necessary tool for any scientist engaged to the field of restoration materials and techniques.

▪ GIS APPLICATIONS FOR A NEW APPROACH TO THE ANALYSIS OF PANEL PAINTINGS (Project paper)

Laura Baratin et al.

Abstract:

A work of art, considered in its complexity and in its evolution over time, requires knowledge and thorough study in order to arrive at its correct interpretation, a prerequisite for any conservation and maintenance interventions. The evaluation of the preliminary information on the work of art and its analytical reading are closely interrelated to a careful and critical use of the technical and operational instruments defined in a comprehensive and focused methodological programme. Information technology and the integration of multidisciplinary knowledge lead to making even more powerful forms of support available for a phase of documentation, as a means of investigation and organisation of the information, followed by analysis and processing that implement the knowledge of the work of art. Instruments for the 3D surveys of the panels and software for processing and post-processing allow us to obtain digital models of the surveyed surfaces, which are implemented in the GIS environment. We take advantage of the advanced analytical and management capacities, normally applied to the territory, with a simple change of scale, allowing us to carry out detailed investigations on the painting, on the paint film and on the supporting panel. Quantitative evaluations of the metric/statistical type on the spatial distribution of the elements are flanked both by colourimetric analysis, vectorising the RGB components and extrapolating the useful information, and by graphic analysis of the iconographic composition and on the conservation status. We then process the three-dimensional data relative to the morphology of the panel, allowing the identification of any critical aspects or elements of deterioration, until reaching a geometrical comparison among subsequent acquisitions that allows us to identify any displacement due to modifications of the support. The application of the method also allows us to define a comparison between diverse sensing systems to verify their accuracy and effectiveness, in a perspective of programmed management of interventions that will optimise costs and benefits and predispose the elevation profiles to study the morphological evolution along particular lines of interest. The GIS application in a field which is so different from the usual context of usage provides innovative scenarios and various potentials of data analysis and processing.

▪ APPLICATION OF DIGITAL TECHNOLOGIES IN THE RESTORATION OF HISTORIC BUILDINGS AND HERITAGE OBJECTS. A SELECTION OF PRACTICAL EXAMPLES (Short paper)

Yves Vanhellemont et al.

Abstract:

Three institutes have been aiming to stimulate the application of digital technologies for the restoration of historic buildings. This project was not aiming to develop techniques, but merely to point out to building professionals how such techniques might help in optimizing the restoration process, including the actual manufacturing of elements to be employed while restoring a building. The application of scanning technologies is already quite well known for the purpose of documentation and preparation of architectural work. In this project we wanted to go further, to explore how techniques such as additive manufacturing (3d-printing) and CNC (Computer Numerical Control) might help to produce elements that can directly be used in the restoration of buildings,

particularly the more complex, sculptural parts of buildings. Applications are possible in the field of natural stone (as well as its replacements with artificial stone), metals (bronze, brass and cast iron) and ceramics. In this paper represents a state of the art as it exists in Flanders: an overview of several techniques and their possibilities, and future prospects

▪ **CONSERVATION AND VALORIZATION OF HERITAGE ETHNOGRAPHIC TEXTILES** (Short paper)

Adriana Ispas et al.

Abstract:

The textiles make up a fragile heritage, continuously exposed to erosion through the natural aging of the fibres, environmental conditions and human actions. The aim of the MYTHOS project is the development of textiles from natural fibers (flax and hemp) which are biologically and technologically similar to the textiles found in heritage collections. A multidisciplinary research, involving specialists in ethnography, physics, molecular biology, chemistry and textile industry started with the analysis of the ethnographic textiles found in the National Museum of the Romanian Peasant's collection and a study of the traditional methods of cultivation and processing of flax and hemp. The textiles obtained as a result, similar to the heritage textiles, will be tested in restoration work, the results of this project seeking to benefit all the cultural organizations which hold collections of bast fibre textiles.

▪ **USE OF 3D DIGITAL MODEL FOR ESTIMATION OF COMPOSITION OF MEDIEVAL COINS** (Full paper)

Jaroslav Valach

Abstract:

An appearance of the metallic object like coin is an important clue of its material content, but the surface layer can significantly differ from the true composition of the bulk. Therefore, since the Archimedes times the density matters as relevant indicator of the content. Measuring dimensions of a very irregular object in order to get its volume may be difficult or impossible. Pycnometers are used to deter-mine the volume of small objects utilizing procedure involving filling known volume either with liquid or gas. Unfortunately, this method cannot be adopted in the case of fragile or sensitive objects of cultural heritage and therefore this approach has to be substituted with another one of noninvasive and noncontact nature. Among possible techniques, a 3D digital model of the object can be used. In this paper, we concentrate on comparing results of the volume of small objects measured directly to the volume calculated from digital models obtained by two differ-ent 3D digitization techniques. Coins were used for the case study because they can be used in gas pycnometer and therefore there is a possibility of direct comparison to calculated volume. As shown in discussion the results are comparable, it is possible to use the digital models to determine the volume and density of objects, but as concerns the composition, the uncertainty is widened. On the other hand, the results of composition estimation based on other methods, like elemental analysis, yield even larger errors.

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