

# Plenary Session

**The Mirrorword** - Susan Hazan *CEO, Israel Consortium Digital Culture (ICDC), at Digital Heritage, Israel*

**Project Aerariumchain**, Giorgio Rea, *Aerariumchain Team Leader*. PhD in Archaeology at Université Paris-Sorbonne and Università degli Studi di Milano. Experienced archaeologist specialized in research of Roman urban contexts and Roman wall painting. Daniele Buesich, Archaeologist specialized in Roman Provinces, expert in new technologies applied to the investigation and dissemination of Cultural Heritage.

## Geomatics 4 water-related CH

**Heritage Evaluation: restoration plan through HBIM and MCDA** - Giovanna Acampa and Mariolina Grasso *University Kore of Enna*

**Geomatic measurement of "New Aniene" and "Claudia" roman aqueducts for flows estimation**,

Valerio Baiocchi, Claudio Alimonti, Giorgia Bonanotte and Gabor Molnar

*Sapienza University of Roma, MTA-ELTE University*

**Study and 3D survey of the Roman baths in the archaeological site of Lylibaeum (Marsala, Italy),**

Donatella Ebolese and Mauro Lo Brutto

*Dept. Cultures and Societies University of Palermo, Dept. of Engineering University of Palermo*

**Geomatics for studying historic supply systems: the Grotta degli Animali case study** Grazia Tucci, Valentina Bonora, Alessandro Conti, Lidia Fiorini

*GeCO Lab, Department of Civil and Environmental Engineering,*

*University of Florence, Firenze, Italy*

**A HGIS for the study of waterways: the case of Bologna as ancient city of waters**

Gatta Giorgia, Bitelli Gabriele

*DICAM University of Bologna*

**Geomatics techniques for the 3D survey of the Arno River to support hydraulic studies** Paolo Aminti, Valentina Bonora, Manuela Corongiu, Francesco

Mugnai, Erica Isabella Parisi and Grazia Tucci *Civil and Environmental Engineering Department, University of Florence, Italy*

**Image enhancement comparison to improve underwater cultural heritage survey** Eva Savina Malinverni, Carlo Cerrano, Ubaldo Pantaleo, Corinne

Andreola, Marina Paolanti, Stefano Chiappini and Roberto Pierdicca

*Università Politecnica delle Marche, UBICA srl*

**Geomatic multiscale approach for the conservation of archeological sites: the case of Alba Fucens (L'Aquila-Italy)** Maria Alicandro, Donatella Dominici,

Raimondo Quaresima, Sara Zollini, Davide De Luca and Sara Pietrangeli

*Università degli Studi dell'Aquila*

## ICT and Digital Heritage

**Use of the sensors of a latest generation mobile phone for the three-dimensional reconstruction of an archaeological monument: the survey of the Intihuatana stone in Machu Picchu (Peru')**

Valerio Baiocchi, Silvio Del Pizzo, Giovanni Pugliano, Matteo Onori, Umberto Robustelli, Salvatore Troisi, Felicia Vatore and Francisco James León Trujillo

*University of Lima, University Sapienza Roma, University Parthenope Naples*

**Automatic Emotion Recognition for Cultural Heritage**

Claudio Baecchi, Andrea Ferracani and Alberto Del Bimbo

*MICC - University of Florence*

**Design of robotic and additive manufacturing for cultural heritage**

Fabrizio Formati and Ciro Scognamiglio

*Engineering Dept. University of Campania "Luigi Vanvitelli"*

**Preserving and Promoting the Herbarium of the University of Milan through Digital Technologies**

Adriano Baratè, Marco Caccianiga, Elisabetta Caporali, Luca A. Ludovico, Silvia Pinto, Giorgio Presti, Enrico Sala, Antonella Testa

*Department of Computer Science, University of Milan*

**How can augmented reality improve the user experience of digital products and engagement with cultural heritage outside the museum space?**

Madeleine Garcia Munzer

*MA Digital Humanities (Distinction) - UCL, UK*

**The Sensorial Dimension of the Contemporary Museum between Design and Emerging Technologies**

Sonia Capece and Camelia Chivăran

*RTDa in Industrial Design*

*PhD student in Environment, Design and Innovation*

*University of Campania "Luigi Vanvitelli"*

**Safeguarding Portuguese traditional glazed tile cultural heritage with GIS**

Bertha Santos, Jorge Gonçalves, Ana M. T. Martins, Pedro G. Almeida *UBI & CERISUBI & Lab2PT & CIDEHUS GEOBIOTEC*

**Visual Question Answering for Cultural Heritage**

Pietro Bongini, Federico Becattini, Andrew Bagdanov, Alberto Del Bimbo

*University of Florence*

<p><b>From Text to Model: Translating the Estatutos da Província de Santa Maria da Arrábida</b>  Jesse Rafeiro, (CU; CIMS)  Ana Tomé, (IST-UL; CERIS)  João Luís Fontes, (NOVA FCSH-IEM; CEHR-UCP)</p>
<p><b>Preserving Low-Quality Video through Deep Learning</b>  Lorenzo Seidenari, Leonardo Galteri, Tiberio Uricchio, Marco Bertini, Alberto Del Bimbo  <i>Universita' degli Studi di Firenze, MICC, Media Integration and Communication Center</i></p>
<p><b>The Chiesa della Madonna dei Mali (Ferrandina, Italy) in VR": Virtual Reality for inaccessible cultural heritage in peripheral areas</b>  Antonio Pecci and Ida Campanile  <i>Università degli Studi della Basilicata (DISU)</i>  <i>Università degli Studi della Basilicata (DiCEM)</i></p>
<p><b>Digital survey from drone in archaeology: potentiality, limits, territorial archaeological context and variables</b>  Antonio Pecci  <i>Università degli Studi della Basilicata (DISU)</i></p>
<p><b>Forensic Imaging for Art Diagnostics. What Evidence Should We Trust?</b> Pelagotti, Piva, Uccheddu, Shullani, Alberghina, Schiavone, Massa and  <i>Menchetti Italian National Institute of Applied Optics, INO-CNR</i>  <i>Department of Information Engineering University of Florence</i>  <i>Department of Industrial Engineering University of Florence</i>  <i>Art-Test</i></p>
<p><b>Sheltering megalithic Temples in Malta – evaluating the process through data collection and modelling</b>  Valantinavicius, Micallef, Cassar, Caruana, Ciantelli  <i>Department of Conservation and Built Heritage, Faculty for the Built Environment,</i>  <i>University of Malta, Msida</i>  <i>Department of Environmental Design, Faculty for the Built Environment, University of Malta, Msida,</i>  <i>Prehistoric Sites Department, Heritage Malta</i></p>
<p><b>Augmented reality for cultural heritage: a new dimension for the perceptual knowledge</b>  Romano Fistola, Ornella Amore, Andrea Rastelli and Crystal Pham  <i>Dept. of Engineering, University of Sannio, Benevento - Italy (AURUS Research Group) Dept. of Science, University of Sannio, Benevento - Italy</i>  <i>4Massachusetts Institute of Technology (MIT), Cambridge</i></p>
<h2>Environment for CH</h2>
<p><b>Service life prediction of building components in the times of climate change</b>  Arian Loli, Chiara Bertolin, Lola Kotova  <i>Department of Mechanical and Industrial Engineering, Norwegian University of Science and Technology (NTNU), Trondheim, NORWAY, Climate Service Center Germany (GERICS), Hamburg, GERMANY</i></p>
<p><b>Adaptive reuse, refurbishment and conservative rehabilitation of Cultural Heritage by means of Quality and Energy Sustainable Lighting</b>  Carla Balocco and Martina Cecchi  <i>Department of Industrial Engineering, University of Florence</i>  <i>Freelance Civil Engineering collaborating with the Industrial Engineering Department, University of Florence</i></p>
<p><b>Modelling Sustainable Lighting with Eyetracker and Spatial Syntax techniques</b>  Carla Balocco, Francesco Leccese, Giacomo Salvadori and Giulia Volante  <i>Department of Industrial Engineering, University of Florence, Italy</i>  <i>Department of Energy, Systems, Territory and Constructions Engineering, University of Pisa, Italy</i></p>
<p><b>MAGIC: Manuscripts of Girolamini in Cloud</b>  Guido Russo  <i>(University of Naples) for the MAGIC Collaboration</i></p>
<p><b>The path of Cham cultural heritage</b>  Ngô Minh Hùng ,William B. Noseworthy, Quảng Văn Sơn - <i>Van Lang University, Ho Chi Minh City, Vietnam</i>  <i>McNeese State University, USA</i></p>
<p><b>TRANSFORMATION OF BUILT CULTURAL HERITAGE IN OLD SAIGON (HO CHI MINH CITY), VIETNAM</b>  NGO MINH HUNG  <i>Institute of Cultural Heritage and Development Studies Van Lang University, Vietnam</i></p>
<p><b>COMMUNITY BASED BEHAVIOR TOWARDS AFFORDANCES IN CONSERVATION OF HANOI ANCIENT QUARTER IN THE VIETNAM CONTEXT</b>  NGO MINH HUNG  <i>Institute of Cultural Heritage and Development Studies Van Lang University, Vietnam</i></p>
<p><b>In-situ checking various mechanical parameters of original nail connections between crossbeams and wooden support, in the framework of an innovative method for rationally dimensioning the crossbeams of panel paintings, applied on an original artwork</b>  MAZZANTI Paola, RIPARBELLI Lorenzo, GUALDANI Giovanni, CASTELLI Ciro, RICCIARDI Luciano, SANTACESARIA Andrea , TOGNI Marco, UZIELLI Luca  DAGRI (former-GESAFA), University of Florence, Florence, Italy  <i>Opificio delle Pietre Dure, Florence, Italy</i></p>
<p><b>Experimental tests for mechanical properties of wooden 'buttons' used for attaching auxiliary supports behind panel paintings</b>  Paola Mazzanti, Lorenzo Riparbelli, Bertrand Marcon, Giulia Fabiani, Marco Togni, Luca Uzielli, Andrea Santacesaria and Ciro Castelli  <i>University of Florence, Opificio delle Pietre Dure</i></p>
<h2>European Funds For CH</h2>

<p><b>The RESEARCH project. Soil-related hazards and archaeological heritage in the challenge of climate change</b> Stefano De Angeli , Fabiana Battistin , Matteo Serpetti , Alessio Di Iorio, Federico Valerio Moresi <i>Università degli Studi della Tuscia, Viterbo, Italy</i> <i>ALMA SISTEMI Srl Roma, Italy</i></p>
<p><b>COLLECTIONCARE: AN AFFORDABLE SERVICE FOR THE PREVENTIVE CONSERVATION MONITORING OF SINGLE CULTURAL ARTEFACTS DURING DISPLAY, STORAGE, HANDLING AND TRANSPORT</b> Ángel Perles, Laura Fuster-López, Fernando J. García-Diego, Andrea Peiró-Vitoria, Ana María García-Castillo, Cecil Krarup Andersen, Emanuela Bosco, Efthimios Mavrikas and Tomás Pariente <i>Universitat Politècnica de València</i> <i>The Royal Danish Academy of Fine Arts, Schools of Architecture, Design and Conservation</i> <i>POSTSCRIPTUM Communications Informatics LTD</i> <i>Eindhoven University of Technology</i> <i>ATOS Spain SA</i></p>
<p><b>Proposal for the enhancement of Marzamemi's underwater heritage through the use of digital methodologies</b> PhD. M<sup>a</sup> Belén Prados-Peña PhD. M<sup>a</sup> Paz Saez-Perez PhD. Ana Garcia-López <i>University of Granada</i></p>
<p><b>REMEMBER: an Adriatic network of Virtual Museums to highlight ports culture, traditions and history</b> Ramona Quattrini, Federica Bosello, Cristiana Colli, Paolo Clini, Ivana Dražić, Domagoj Dražina, Andrea Pugliese and Guido Vettore <i>Central Adriatic Ports Authority, North Adriatic Sea Port Authority , Polytechnic University of Marche, National Museum of Zadar</i></p>
<h1>Materials Science and Sustainable Arch. For CH</h1>
<p><b>The Monumental Architecture of Po Ramé in Ninh Thuan Province, Vietnam</b> Quảng Văn Sơn, Ngô Minh Hùng ,William B. Noseworthy, - <i>Van Lang University, Ho Chi Minh City, Vietnam</i> <i>McNeese State University, USA</i></p>
<p><b>The influence of loading, temperature and relative humidity on adhesives for canvas lining</b> Hans Poulis, Kate Seymour and Yasmine Mosleh <i>Stichting Restauratie Atelier Limburg</i> <i>Delft University of Technology</i></p>
<p><b>Analysis the polychromy on stone of a 16th century gothic Portal in the Cathedral of Santo Domingo</b> Esteban Prieto Vicioso, Pedro Henríquez Ureña, Virginia Flores Sasso, Letzai Ruiz Valero, José María García de Miguel <i>Universidad Nacional Pedro Henríquez Ureña</i> <i>Dominican Republic Pontificia Universid</i></p>
<p><b>Functional mortars for conservation of cultural heritage structures</b> Vucetic, Miljevic, Sovljanski, van der Bergh, Markov, Hirszenberger, Tzoutzouli Malesevic, Ranogajec1 <i>University of Novi Sad, Faculty of Technology, Laboratory of Materials in Cultural Heritage</i> <i>University of Novi Sad, Faculty of Technical Sciences</i> <i>Technical School "Mileva Maric Ajnstajn", Novi Sad, Serbia</i></p>
<h1>Engineering</h1>
<p><b>Digital Experience of the Work of Vitruvius and Leonardo</b> Stefano Brillarelli Massimo Callegari Luca Carbonari Paolo Clini <i>Polytechnic University of Marche</i></p>
<p><b>Dynamical and structural analysis of a Bronze Age war chariot</b> Angelo Mazzu', Stefano Uberti and Ileana Bodini <i>University of Brescia - Department of Mechanical and Industrial Engineering</i></p>
<p><b>Application of Systematic Design Methods to Cultural Heritage Preservation</b> Lorenzo Fiorineschi, Roberta Barsanti, Gaetano Cascini, Federico Rotini <i>Department of Industrial Engineering, University of Florence, Italy</i> <i>Museo Leonardiano of Vinci, Italy</i> <i>Dipartimento di Meccanica, Politecnico di Milano, Italy</i></p>
<p><b>A Cultural Heritage experience for visually impaired people</b> Alice Lo Valvo, Domenico Garlisi, Laura Giarré, Daniele Croce, Fabrizio Giuliano, Ilenia Tinnirello <i>Università degli studi di Modena e Reggio Emilia</i> <i>University of Palermo</i></p>
<p><b>A low-cost ChArUco-based 3D scanner for cultural heritage</b> Luca Puggelli, Rocco Furferi, Yary Volpe and Lapo Governi <i>University of Florence - Department of Industrial Engineering</i></p>
<p><b>Digital craftsmanship for education and diffusion of scientific culture: the model of herringbone masonry in a circular dome</b> Alexia Charalambous, Giuliana Di Iacovo, Federica Loccarini and Giovanna Ranocchiai <i>Department of Civil and Environmental Engineering - University of Florence</i></p>

**A preliminary approach on point cloud reconstruction of bronze statues through oriented photogrammetry: the «Principe Ellenistico» case** Bici, Gherardini, Campana, Leali  
*Dipartimento di Ingegneria Meccanica e Aereospaziale, Sapienza Università di Roma*  
*Dipartimento di Ingegneria "Enzo Ferrari", Università degli Studi di Modena e Reggio Emilia*

## Diagnostic and Monitoring

**Conservation and Characterization of Arabic Papyrus in Egyptian National Library and Archives, Egypt**

Arzak Mohamed, Petronella Nel, Wafika Wahba, Amany Kamel and Robyn Sloggett  
*Restoration Department, Faculty of Archaeology; Fayoum University*  
*Grimwade Centre for Cultural Materials Conservation, Melbourne University*

**Groundwater damages on the historic buildings of Cairo: the case of the medieval walls of Mokattam limestone.**

Michele Coppola, Francesco Di Benedetto, Carlo Alberto Garzonio, Elena Pecchioni and Alba Patrizia Santo  
*Department of Architecture, University of Florence, Florence, Italy*  
*Department of Earth Science, University of Florence*

**The study of Severini's wall paintings in Switzerland: how to manage heterogeneity of data and team members?**

Jacopo Russo, Stefania Luppichini, Chiara Stefani, Francesca Piqué  
*University of Applied Sciences and Arts of Southern Switzerland (SUPSI)*  
*Archeotech SA, Switzerland*

**Efficiency evaluation of chemical and physical methods for the removal of spray paints from marble substrates**

Matilde Bargi, Maria Pia Morigi, Raffaella Fontana, Enrico Pampaloni, Jana Striova and Barbara Salvadori  
*Palazzo Spinelli*  
*Università di Bologna-X-Ray Imaging Group, Dipartimento di Fisica e Astronomia*  
*CNR – Istituto Nazionale di Ottica Applicata*  
*CNR – Istituto di Scienze del Patrimonio Culturale*

**Indoor Air Quality in the Uffizi Gallery of Florence: sampling methodology and preliminary results**

Cristina Carletti, Gianfranco Cellai, Fabio Sciarpi, *DIEF - University of Florence*  
Giuseppe Russo, Eike D. Schmidt, *Uffizi Gallery – Florence, Italy*

**Design as Collaborative Connection between User, Technology and Cultural Context**

Giovanna Giugliano | *PhD student in Environment, Design and Innovation*  
Elena Laudante | *PhD in Environment, Design and Innovation*  
*Department of Engineering, University of Campania "Luigi Vanvitelli"*

**Microclimatic monitoring for book heritage preservation in historic buildings: preliminary investigation on "Sala del Dottorato" in Palazzo Murena, Perugia, Italy**

Elisa Moretti, Fabio Sciarpi, Ettore Stamponi and Monica Fiore *Department of Industrial Engineering – University of Florence*  
*Department of Engineering - University of Perugia*  
*CIRIAF – University of Perugia*  
*Centro Servizi Bibliotecari - CSB - University of Perugia*

**Using 3D scanning to support conservation treatments for paintings**

Liselore Tissen, Kate Seymour, Willemijn Elkhuisen, Sofie Dubbeldam, Steinunn Hardadottir, Ivana Jerdoneková, Jolijn Schilder and Christa Molenaar  
*Leiden University, Leiden. The Netherlands*  
*Stichting Restauratie Atelier Limburg, Maastricht. The Netherlands*  
*University of Amsterdam, Amsterdam. The Netherlands*  
*Delft University of Technology, Delft. The Netherlands*

**Hypercolorimetric multispectral Imaging and Pulse Compression thermography as innovative combined techniques for painting investigation: the case of a detached wall painting by Pastura**

G. Agresti, P. Burrascano, G. Calabrò, C. Colantonio, L. Lanteri, S. Laureti, M. Melis, C. Pelosi, M. Ricci, S. Sfarra  
*University of Perugia, University of Tuscia, University of L'Aquila, University of Calabria, Profilocolore srl*

**Monitoring and Conservation plans for monumental stone buildings. The case study of the Baptistery of San Giovanni in Corte in Pistoia - Mila**

Martelli, Maria Jose' Ybañez Worboys, Valerio Tesi - *Università di Firenze, Superintendente of Archeology, Fine Arts and Landscape Florence, Pistoia and Prato*

**Non-invasive characterization of the pigment's palette used on the painted tomb slabs at Paestum archaeological site**

M. F. Alberghina, C. Germinario, G. Bartolozzi, S. Bracci, C. Grifa, F. Izzo, M.F. La Russa, D. Magrini, E. Massa, M. Mercurio, V. Mollica Nardo, M.E. Oddo, S. M. Pagnotta, A. Pelagotti, R. C. Ponterio, P. Ricci, N. Rovella, S. A. Ruffolo, S. Schiavone, A. Spagnuolo, C. Vetromile, G. Zuchtriegel, C. Lubritto  
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*Energreenup srl, Pietramelara (CE), Italy*

*Parco Archeologico di Paestum, Paestum (SA), Italy*

*Istituto Nazionale di Fisica Nucleare (INFN) – Sezione di Napoli*

**Applications of Non-Destructive Techniques in the study of a Caribbean historic timber house**

Virginia Flores Sasso, Esteban Prieto Vicioso, Gabriela Fernández Flores and Raquel Carreras Rivero

*Pontificia Universidad Católica Madre y Maestra, Universidad Nacional Pedro Henríquez Ureña*

**X-ray computed tomography for the study of mural paintings – the case of São Tiago Church**

Alexandra Marco, Bruno Campos, Manuela Pintado, Eduarda Vieira, Patrícia R. Moreira

*Escola das Artes, Universidade Católica Portuguesa, Porto, Portugal*

*CITAR – Centro de Investigação para a Ciência e a Tecnologia das Artes, Universidade Católica Portuguesa, Porto, Portugal.*

*CBQF – Centro de Biotecnologia e Química Fina, Universidade Católica Portuguesa, Porto, Portugal*

**Validation and management of the data acquisition and restitution processes in HBIM models: the case study of Fonte della Fata Morgana**

Carlo Biagini, Paolo Ottobri, Neri Banti, Andrea Bongini

*Department of Architecture, University of Florence, Italy*

**Assessment of residual effectiveness for Water-Repellent treatments for building stones. Water absorption tests on the monumental complex**

**Cathedral of San Zeno and the Baptistery of San Giovanni in Corte in Pistoia** Martelli, Salvatici, Garzonio, De Vita *University of Florence*

**An interdisciplinary study of (bio)deterioration of the external marbles of Santa Maria del Fiore Cathedral, Florence (IT)**

Brunella Perito, Alice Checucci, Elena Pecchioni, Beatrice Agostini, Alba Patrizia Santo

*Opera di Santa Maria del Fiore*

*Department of Biology, University of Florence*

**STORM Policies and Recommendations a new vision for authorities, first responders and civil protection towards an effective protection of cultural heritage**

Luis Alexandre Senior, Alcides Bizarro

*Technician European funds applications and projects*

*Head of Division Municipal International Cooperation responsible*

**Disaster and Cultural Heritage: Planning and Prevention, Procedures for Emergency and Risk Reduction**

Enrica Di Miceli, Rosa Grazia De Paoli and Francesca Giuliani

*Sapienza University*

*Mediterranean University of Reggio Calabria*

*University of Pisa*

**Virtual Reality bridge between Chemistry and Cultural Heritage: the "Sala degli Stemmi" Case Study.**

Virtual Reality bridge between Chemistry and Cultural

Heritage: the "Sala degli Stemmi" Case Study.

Martino, Lazzari, Tasinato and Barone

*Scuola Normale Superiore, Pisa, Italy*

## Cultural heritage Microbiomes

**Natural biocides and bio-calcite: innovative tools for cultural heritage**

Laura Scrano, Rocco Laviano, Giovanni Salzano, Matteo Santacroce, Sergio Antonio De Franchi, Jakub Baranek and Sabino Aurelio Bufo

*University of Basilicata, University of Bari, Adam Mickiewicz University*

**Microbial contamination of libraries and archives: risk assessment and contamination control**

F Bosco, M Demichela, A A Barresi and D Fissore

*Department of Applied Science and Technology, DISAT, Politecnico di Torino*

**What Sherlock Surely missed: The EVA Technology for Cultural Heritage Exploration** Pier Giorgio RIGHETTI - HONORARY PROFESSOR

*Department of Chemistry, Materials and Chemical Engineering "Giulio Natta",*

*Politecnico di Milano*

**Bacterial mineralization of calcium carbonate for conservation of stone artworks**

Brunella Perito, Massimiliano Marvasi, Giorgio Mastromei

*Department of Biology, University of Florence*

**Integrative Applications of Microbial Biotechnology to Cultural Heritages Conservation and Promotion**

Massimiliano Marvasi

*University of Florence*

**Paleogenetic analysis for the valorization of Cultural Heritage**

Martina Lari, Stefania Vai, Valentina Zaro, David Caramelli

*Dipartimento di Biologia, Università di Firenze*

*Laboratorio di Antropologia Molecolare e Paleogenetica*