Heritechne conference

Program

Scientific committee

Anagnostopoulos, Christos-Nikolaos — *University of the Aegean, Greece*
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Cucinotta, Filippo — *Università degli Studi di Messina, Italy*
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Malinverni, Eva Savina — *Università Politecnica delle Marche, Italy*
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Marannano, Giuseppe — *Università degli Studi di Palermo, Italy*
Morabito, Anna Eva — *Università del Salento, Italy*
Marcelli, Marina — *Sovrintendenza Capitolina, Italy*
Muzzupappa, Maurizio — *Università della Calabria, Italy*
Palestini, Caterina — *Università "G. D'Annunzio" di Chieti–Pescara, Italy*
Pintus, Renata — *MiC · Opificio delle Pietre Dure, Italy*
Proietti, Noemi — *CNR · Istituto di Scienze del Patrimonio Culturale (Rome), Italy*
Quattrini, Ramona — *Università Politecnica delle Marche, Italy*
Rinaudo, Fulvio — *Politecnico di Torino, Italy*
Rizzi, Caterina — *Università degli Studi di Bergamo, Italy*
Rodríguez Navarro, Pablo — *Universitat Politècnica de València, Spain*
Tornari, Vivi — *FORTH, Greece*
Trizio, Ilaria — *Istituto per le Tecnologie della Costruzione – CNR, L'Aquila, Italy*
Zimeo, Eugenio — *Università degli Studi del Sannio, Italy*

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Martina Sciomenta, *University of L'Aquila*
Luca Vespasiano, *University of L'Aquila*
Sara Zollini, *University of L'Aquila*

Wednesday 10

14:00-16.00 **Registration**

14:30-15:00 **Opening Speech**

Fabio Graziosi, *Rector of University of L'Aquila*

Caterina Rizzi, *President of ADM (Associazione nazionale Disegno e Metodi dell'ingegneria industrial)*

Paolo Di Stefano, Director of Heritechne *(Interdepartmental research center on technologies for cultural heritage)*

15:00-16:00 **Keynote Speeches**

Alessandro D'Alessio, *Director of the Parco archeologico di Ostia antica*

Eike Schmidt, *Director of the Museo e Real Bosco di Capodimonte*

16:00-16:30 **Coffee Break**

16:30-18:00 **Special Session**
Integrating Immersive and Intelligent Technologies for Cultural Heritage Innovation

18:00-18:30 **Special Session**
Emerging Technologies for the Documentation, Conservation, and Promotion of the Underwater Cultural Heritage

Thursday 11

8:30-9:00	**Registration**
9:00-10:30	**Special Session** Geomatics techniques with a multi-scale approach
10:30-11:00	**Coffee Break**
11:00-12.00	**Special Session** Non-invasive techniques and methods for diagnostics applied to cultural heritage and knowledge of constituent materials
11:50-13:00	**Special Session** Advanced and Smart Technologies for Indoor Microclimate Management in Cultural Heritage
13:00-14:00	**Lunch Break**
14:30-15:30	**Regular Session I**
15:30-16:00	**Coffee Break**
16:00-17:00	**Regular Session II**
17:00-18:00	**Keynote Speeches** Aniello Russo Spena, *President of the Accademia delle scienze d'Abruzzo*, Speech in honor of Antonio De Paulis Federica Zalabra, *Director of the MuNDA* (Museo Nazionale d'Abruzzo)
20:30	**Gala Dinner & Best Paper Awards**

Friday 12

8:30-9:00	**Registration**
9:00-10:30	**Special Session** What technologies for knowledge and conservation of cultural heritage?
10:30-11:00	**Coffee Break**
11:00-12:15	**Special Session** Ancient Roman hydraulic infrastructures: knowledge, modelling, design, and function
12:15-13:00	**Special Session** Digital Innovation in Cultural Heritage: Trends in Italy and China
13:00-14:00	**Lunch Break**
14:00-16:00	**Visit to the MuNDA museum**
16:00-18:00	**Multimedia and immersive reconstructions of the historical heritage of the L'Aquila area**

Wednesday 10 - 16:30-18:00

Special session

Integrating Immersive and Intelligent Technologies for Cultural Heritage Innovation

Chair: Prof. Henry Muccini

Organized by: Prof. Henry Muccini, Dr. Federico Martusciello

From Monitoring to Immersive Experiences: A Federated Digital Twin Framework for Intelligent Cultural Heritage Ecosystems

DAGNAW, Gizealew Alazie; MARTUSCIELLO, Federico

HERITECHNE – DISIM, University of L'Aquila

Marker-Based Anchoring and Spatially Grounded Conversational AI for In-Situ Mixed Reality Cultural Heritage

MARTUSCIELLO, Federico; MACERA, Luca; DAGNAW, Gizealew Alazie

HERITECHNE – DISIM, University of L'Aquila

Improving cultural experience of users: a modular evaluation pipeline for graph-based recommendation

CASILLO, Mario[1]; CECERE, Liliana[2]; LOMBRADI, Marco[1]; SANTANIELLO, Domenico[1]; STROLLO, Giusy[3]; VALENTINO, Carmine[2]

[1] DISPAC, University of Salerno; [2] DIIN, University of Salerno; [3] DICIV, University of Salerno.

Gaussian Splatting vs. Photogrammetry for Immersive Cultural Heritage: An Operational Evaluation

COLACE, Francesco[1]; DUARTE PETTI, Constanza Fiorella[1]; LORUSSO, Angelo[2]; PELLEGRINO, Michele[1]; STROLLO, Pietro Giuseppe[1]; TROIANO, Alfredo[3]

[1] DIIn, University of Salerno; [2] Pegaso Telematic University, Italy; [3] Netcom Group

Immersive Dissemination from Survey Data: A Dual-Mode XR Experience Based on a Digital Heritage Twin

COLACE, Francesco[1]; LORUSSO, Angelo[2]; PASSEGGIATO, Angela[1]; PELLEGRINO, Michele[1]; SANTANIELLO, Domenico[3]; VALENTINO, Carmine[1]

[1] DIIn, University of Salerno; [2] Pegaso Telematic University, Italy; [3] Dispac, University of Salerno

Audio-Based Context Recognition for Augmented Reality in Live Musical Performances

CANFORA, Gerardo[1]; COLARUSSO, Carmine[1]; ZIMEO, Eugenio[1,2]

[1] University of Sannio; [2] CINI Smart Cities and Communities Lab, Italy

Wednesday 10 - 18:00-18:30

Special session

Emerging Technologies for the Documentation, Conservation, and Promotion of the Underwater Cultural Heritage

Chair: Prof. Loris Barbieri

Organized by: Prof. Loris Barbieri, Dr. Barbara Davidde, Dr. Antonio Lagudi

Enhancing Operator Perception in Underwater Cultural Heritage Manipulation via Stereo-Based AR/AV Interfaces

RINO, Vincenzo; CALABRIA, Michele; LAGUDI, Antonio; BARBIERI, Loris; BRUNO, Fabio

University of Calabria

Process-Oriented Vulnerability Modeling for Underwater Cultural Heritage: From Structured Diagnosis to Parametric Degradation Indices

DAVIDDE, Barbara[1]; LAGUDI, Antonio[2]; SACCO PERASSO, Carlotta[3]; BRUNO, Fabio[4]

[1] Central Institute for Restoration; National Superintendecy for Underwater Cultural Heritage, Italy; [2] Department of Mechanical, Energy and Management Engineering University of Calabria; [3] National Superintendecy for Underwater Cultural Heritage, Italy; [4]Department of Mechanical, Energy and Management Engineering, University of Calabria

Thursday 11 - 9:00-10:30

Special session

Geomatics techniques with a multi-scale approach

Chair: Prof. Donatella Dominici, Prof. Raimondo Quaresima

Organized by: Prof. Donatella Dominici, Prof. Maria Alicandro, Dr. Sara Zollini, Dr. Nicole Pascucci

State of the art of the multiscale geomatics approach for the study of the archaeological site of Alba Fucens (L'Aquila, Italy)

ALICANDRO, Maria; ZOLLINI, Sara; PASCUCCI, Nicole; FINI, Antonio Maria; QUARESIMA, Raimondo; DOMINICI, Donatella

HERITECHNE - DICEAA, University of L'Aquila

A Hybrid Workflow for Automated Detection of Surface Degradation in Archaeological Walls: A Case Study at Alba Fucens (Italy)

PASCUCCI, Nicole; ALICANDRO, Maria; ZOLLINI, Sara; QUARESIMA, Raimondo; FINI, Antonio Maria; DOMINICI, Donatella

HERITECHNE – DISIM, University of L'Aquila

A Multi-Scale Geomatic Framework for Accessibility Planning in Historic Urban Fabrics

CHIAPPINI, Stefano; DI STEFANO, Francesco; DI LEO, Benedetta; HAMIDA, Yasmine; D'OTTAVI, Sara; VITALETTI, Lucrezia; MALINVERNI, Eva Savina; FERRETTI, Maddalena

Dipartimento di Ingegneria Edile, Civile e Architettura, Università Politecnica delle Marche, Ancona.

Detecting Medieval Building Site Features with Multi-Sensor Photogrammetry and Digital Image Processing

MOSCHETTO, Francesco[1]; ZOLLINI, Sara[2]; PREVITI, Giulia[3]; ALICANDRO, Maria[2]; PASCUCCI, Nicole[2]; FINI, Antonio Maria[2]; SOMMA, Maria Carla[4]; LEMORINI, Cristina[3]; DOMINICI, Donatella[2]

[1] DIUSS, Department for Humanistic, Scientific and Social Innovation, University of Basilicata; [2] HERITECHNE - DICEAA, University of L'Aquila; [3] Department of Science of Antiquities, LTFAPA Laboratory, Sapienza University of Rome; [4] DiS, Department of Science, University of Chieti-Pescara.

Thursday 11 - 11:00-11:50

Special session

Non-invasive techniques and methods for diagnostics applied to cultural heritage and knowledge of constituent materials

Chair: Dr. Enrico Stagnini, Dr. Elena De Panfilis

Organized by: Dr. Enrico Stagnini, Dr. Elena De Panfilis

Monitoring Historic Cities: L'Aquila at Infrared

AMBROSINI, Dario[1]; CICCOZZI, Annamaria[1]; DE RUBEIS, Tullio[2]; PASQUALONI, Giovanni[1]; PAOLETTI, Domenica[1]

[1] HERITECHNE - DIIIE, University of L'Aquila; [2] HERITECHNE – DICEA, University of L'Aquila.

Preliminary study by hyperspectral imaging system applied to an icon painting

GRECO, Manuel; STAGNINI, Enrico; DE PANFILIS, Elena

Gran Sasso Science Institute, Italy.

Portable ATR-FTIR Spectroscopy in Film Archives: Diagnostic Answers to Three Archival Questions

VERGELLI, Lisa[1]; ROSSETTO, Valentina[2]

[1] Sapienza University of Roma, Italy - Istituto Centrale per il Restauro; [2] Cineteca Nazionale.

Set-up for beam characterisation of the MACHINA transportable accelerator and RF power amplifier upgrade

GIUNTINI, Lorenzo[1,2]; CZELUSNIAK, Caroline[1]; TACCETTI, Francesco[1]; CASTELLI, Lisa[1]; CIALDAI, Carlo[1]; LUCCHESI, Elettra[2]; MANETTI, Marco[1]; MASSI, Mirko[1]; LEPORATTI, Mattia[2]; MAZZINGHI, Anna[1,2]; PUCCIANTI, Matteo[2]; RUBERTO, Chiara[1,2]; ROSSI, Massimo[3]; DAFFRA, Emanuela[4]; ROSSI, Sandra[4]; FROSININI, Cecilia[4]; ATHOT, Serge[5]; ANELLI, Giovanni[5]; CIPOLLA, Gino[5]; RUDIEV, Alexander[5]; POMMERENKE, Hermann[5]; LOMBARDI, Alessandra[5]; MONTESINOS, Eric[5]; VRETENAR, Maurizio[5]; GIUNTINI, Lorenzo[5]

[1] Istituto Nazionale di Fisica Nucleare, Firenze; [2] Department of Physics and Astronomy, University of Florence; [3] DB SCIENCE SOLUTIONS ITALY; [4] Opificio Delle Pietre Dure, Florence; [5] CERN–European Organization for Nuclear Research, Geneva.

Thursday 11 - 11:50-13:00

Special session

Advanced and Smart Technologies for Indoor Microclimate Management in Cultural Heritage

Chair: Dr. Mariangela De Vita

Organized by: Dr. Mariangela De Vita, Dr. Ludovico Danza

Toward a Digital Twin for Heritage Conservation: A Multi Level IoT Monitoring Strategy for the Oriental Art Museum E. Chiossone

BELLAZZI, Alice[1]; BAROZZI, Benedetta[1]; BELUSSI, Lorenzo[1]; BOZZO, Luca[2]; DEVITOFRANCESCO, Anna[1]; BENEDETTI, Giacomo[2]; GHELLERE, Matteo[1]; SALAMONE, Francesco[1]; DANZA, Ludovico[1]

[1] ITC-CNR, Construction Technologies Institute of National Research Council of Italy; [2] Associazione Centro di competenza per la sicurezza e l'ottimizzazione delle infrastrutture strategiche START 4.0, Genova

DynRest: towards a dynamic context-aware environmental monitoring for cultural heritage restoration

FEDELI, Arianna; DE PANFILIS, Elena; IOVINO, Ludovico; FALCIANO, Speranza

Gran Sasso Science Institute

User Comfort VS Heritage Protection: an Integrated Tool for Defining Optimal Microclimatic Ranges

DE VITA, Mariangela[1,2]; DE BENEDICTIS, Riccardo[3]; BELLAZZI, Alice[4]; SALAMONE, Francesco[4]; DANZA, Ludovico[4]

[1] Engineering, ICT and Technologies for Energy and Trasportation Department. National Research Council of Italy, Rome; [2] DICEAA, University of L'Aquila; [3] Institute of Cognitive Sciences and Technologies, National Research Council of Italy; [4] Construction Technologies Institute of National Research Council of Italy, Milano

Thursday 11 - 14:00-15:30

Regular session I

Chair: Prof. Dario Ambrosini

A Combined Object Detection and Segmentation Workflow for Stone Deterioration Mapping: A Preliminary Study
ROVEDATTI, Anna[1]; CAGLIO, Simone[2]
[1] Academy of Fine Arts Verona; [2] University of Milano–Bicocca

A Structured Artificial Intelligence Framework for the 3D Reconstruction of Paintings
FURFERI, Rocco; SERVI, Michaela; BUONAMICI, Francesco
University of Florence

Ground-Penetrating Radar and Ultrasonic Investigations for the Identification of Hidden Columns in the Medieval Churches of Rome
ASTRELLA, Matilde
Sapienza University of Rome

From Axis Estimation to Semantic Knowledge Structuring: Methodological Advances in 3D Pottery Analysis
DI ANGELO, Luca; DI STEFANO, Paolo; GUARDIANI, Emanuele; MARZOLA, Antonio
HERITECHNE – DIIIE, University of L'Aquila.

Thursday 11 - 16:00-17:00

Regular session II

Chair: Prof. Cinzia Casieri

STATUARIO-10k: A Novel Instance Segmentation Dataset for Monument Crack Detection

PALMIERI, Giorgio[1]; RANIERI, Andrea[2]; BIASOTTI, Silvia[2]
[1] DIIIE, University of L'Aquila; [2] CNR - IMATI.

Removal of copper stains from travertine by selected hydrogels or deep eutectic solvents

MARCELLETTI, Giada; GABRIELE, Francesco; CASIERI, Cinzia; SPRETI, Nicoletta
HERITECHNE - Department of Physical and Chemical Sciences, University of L'Aquila

Multipurpose knowledge modelling strategies for heritage sites: the Cappucini Complex in Cagli

QUATTRINI, Ramona[1]; MARIOTTI, Chiara[1]; PETETTA, Leonardo[1];
VIGOLI, Elisabetta[1]; CEPPETELLI, Alessandro[2]
[1] Università Politecnica delle Marche; [2] Sapienza University of Rome

A Storytelling Based XR Authoring for Cultural Heritage: The Case Study of Timpone della Motta

SERRATORE, Sara[1]; DRAGO, Manuel Fortunato[1]; MARINO, Emanuele[1];
BARBIERI, Loris[1]; BROCATO, Paolo[2]; ALTOMARE, Luciano[2]; BRUNO, Fabio[1]
[1] Department of Mechanical, Energy and Management Engineering (DIMEG), University of Calabria;
[2] Department of Humanities (DISU), University of Calabria

L'Ippopede di Eudosso di Cnido

DE PAULIS, Antonio
University of L'Aquila

Friday 12 – 9:00-10:30

Special session

What technologies for knowledge and conservation of cultural heritage?

Chair: Prof. Carla Bartolomucci

Organized by: Prof. Carla Bartolomucci

Crack Information Modelling for Historic Building Conservation: an OpenHBIM Framework

PARENTE, Maria[1]; ZANNI, Tatiana[2]

[1] Dipartimento di Ingegneria e architettura, University of Parma; [2] Dipartimento dei Beni Culturali, University of Padova.

Hidden Structural Layers in Twentieth-Century Restora-tion: Methodological Implications of Non-Destructive Diagnostics in Hybrid Heritage Systems

SCHIAFFINI, Micol

Sapienza University of Rome

Built Heritage Data Analysis and Management for Restoration Intervention Practices on Field

VACCARIELLO, Alessia

Sapienza University of Rome

Operational testing of restoration documentation at the L'Aquila Cathedral

CINQUE, Adriano

University of L'Aquila.

An Integrated Methodology for Microclimatic Monitoring and Preventive Conservation of Archaeological Sites: Environmental Performance of Protective Shelters at Ostia Antica

CIGOGNETTI, Silvia

Sapienza University of Rome

Friday 12 – 11:00-12:00

Special session

Ancient Roman hydraulic infrastructures: knowledge, modelling, design, and function

Chair: Prof. Marcello Di Risio

Organized by: Dr. Piera Fischione, Prof. Francesco Maria Cifarelli, Dr. Marina Marcelli, Dr. Emanuela Ceccaroni

Roman Lake Emissaries, a journey beneath the mountains

PALMIERI DEL BEATO, Laura; CIRANNA, Simonetta; BARTOLOMUCCI, Carla

University of L'Aquila

A preliminary hydraulic numerical study on the roof-level channel of the Serapeum at Hadrian's Villa

ERAMO, Elena[1]; FISCHIONE, Piera[2]; DI NUCCI, Carmine[2]; DI RISIO, Marcello[2]

[1] Tor Vergata University of Rome; [2] HERITECHNE - DICEAA University of L'Aquila

The Ancient Roman Machines to the Fucino Lake Drainage

DI STEFANO, Paolo; GUARDIANI, Emanuele; VASARELLI, Andrea

HERITECHNE – DIIIE, University of L'Aquila

Integrated approaches to the study of the Aqua Traiana in Rome: tools and methodologies for analysis, survey, and documentation

CIFARELLI, Francesco Maria[1]; MARCELLI, Marina[2]; RANIERI, Cristiano[3]; SANTUCCI, Elettra[4]

[1] HERITECHNE - University of L'Aquila; [2] Sovrintendenza Capitolina ai Beni Culturali, Rome; [3]Gruppo spelo-archeologico Vespertilio; [4] Roma Sotterranea

The Survey and 3D Modelling of the Fucino Emissary. Preliminary Notes

CECCARONI, Emanuela[1]; NEPI, Daniele[2]; ROSE, Dario[2]

[1] Soprintendenza Archeologia, Belle Arti e Paesaggio per le province di L'Aquila e Teramo, L'Aquila, Italy; [2] Independent researchers

Friday 12 – 12:00-13:00

Special session

Digital Innovation in Cultural Heritage: Trends in Italy and China

Chair: Prof. Giorgio Colombo

Organized by: Prof. Giorgio Colombo

CIRCLE-BIM: A Digital Ecosystem Integrating BIM, Digital Twins, and AI for Circular Building Life Cycle Management with Cultural Heritage Applications

D'UVA, Domenico[1]; EUGENI, Federico[2]

[1] Department of Architecture, Built Environment, and Construction Engineering (ABC), Politecnico di Milano; [2] DICEAA, University of L'Aquila.

Energy Performance Modelling of Traditional Timber Roofs: A BIM-Based and AI-Supported Analysis of Foguang Temple

RAMPOLDI, Sara Nam Sook; LIN, Hui

Politecnico Milano

Thermal Environment Differences and Renewal Strategies in Historic High-Density University Campuses under Heritage Conservation Constraints

XU, Duo[1]; GALLI, Barbara[2]; ZHANG, Yuxin[1]

[1] Xi'an Jiaotong University, Xi'an, China; [2] Politecnico di Milano.

Cognitive Digital Twins and XR for Preventive Conservation: The Case of the Monza Expiatory Chapel

STEFANONI, Alessandro[1]; FIORETTO, Elena[1]; D'UVA, Domenico[1]; BOLZON, Gabriella[1]; COLOMBO, Giorgio[1]; GALLI, Barbara[1]; YINGTAO, Qi[2]

[1] Politecnico di Milano; [2] Xi'an Jiaotong University, Xi'an, China.

Friday 12

Poster session

Advanced and Smart Technologies for Indoor Microclimate Management in Cultural Heritage

Organized by: Prof. Teresa Nocita

Toward a Digital Twin for Heritage Conservation: A Multi Level IoT Digitalizing memory: the BOBO – Boccaccio Bookshelf project, between digital publishing and philological enhancement. (From manuscript to metadata)

CENTI, Verdiana
University of L'Aquila

Visual Writing. AI Transcoding of Alatiel's Novella (Decameron II,7) and the Screenplay for Yorgos Lanthimos' Film Poor Things

MACRINI, Giorgia
University of L'Aquila

The Lexicon of Emotion. A semantic analysis (DH – Digital Humanities) of Elsa Morante's short story "Lo scialle andaluso"

GIANFRANCESCO, Giada
University of L'Aquila

Venues & Places

Conference venue
Università degli Studi dell'Aquila,
Centro Congressi *Luigi Zordan*
Piazza S. Basilio, 3

Gala dinner venue
Sala Baiocco
Albergo Italia, Corso Vittorio Emanuele II, 81

Place to visit
MUNDA Museo Nazionale d'Abruzzo
Castello Cinquecentesco, Viale Benedetto Croce

UNIVERSITÀ
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DELL'AQUILA

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e Ambientale

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di Scienze
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e Matematica