

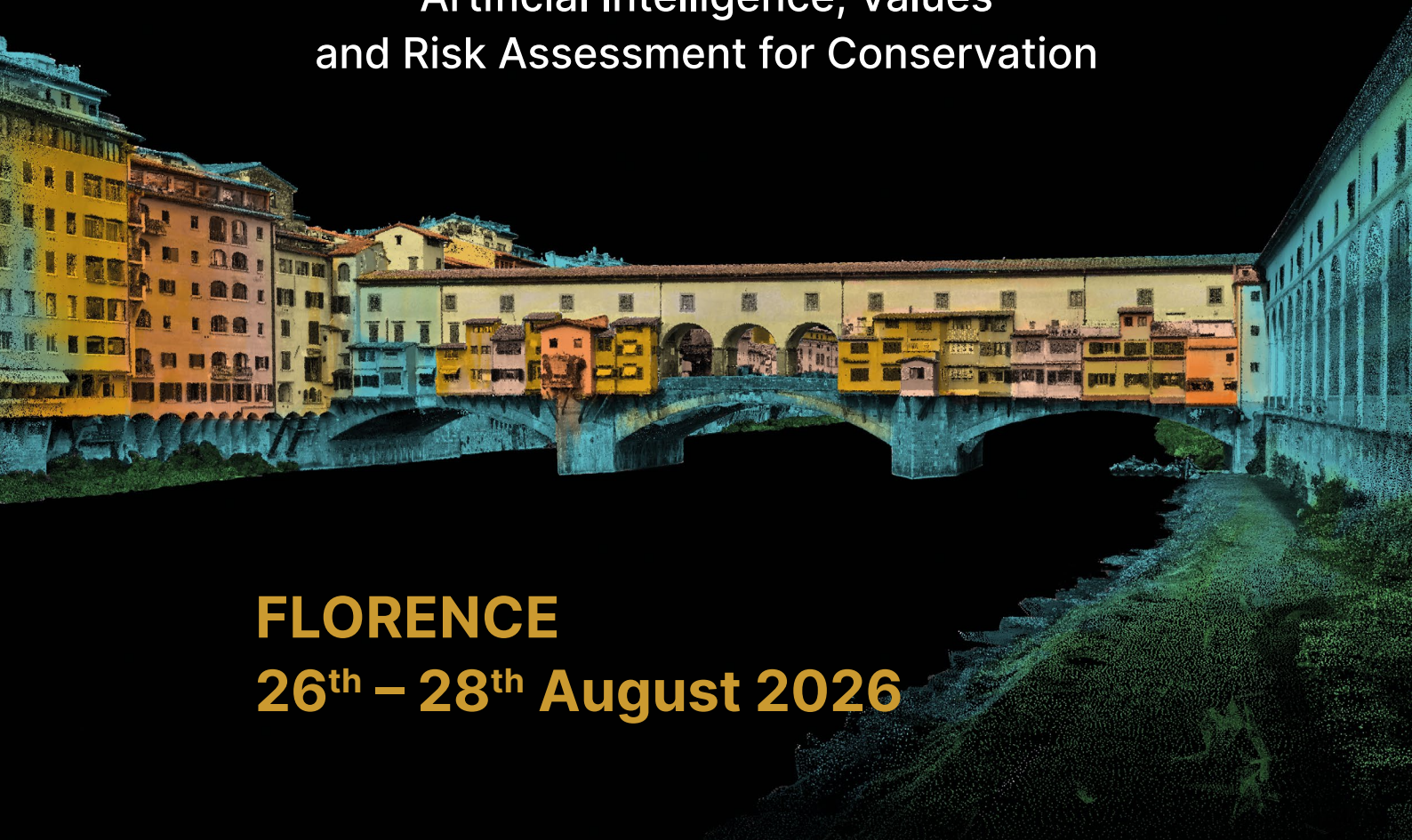
10th AR&VED/DS/CA 2.0 4th GEORES 2026

ORGANIZED BY



DIGITAL ECOSYSTEMS FOR HERITAGE 4.0

Artificial Intelligence, Values
and Risk Assessment for Conservation



FLORENCE
26th – 28th August 2026

DETAILED PROGRAMME

CO-ORGANIZED BY



UNIVERSITÀ
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Documentation

CHANGES



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dei Monumenti e dei Siti
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Restauro dell'Architettura

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In 2026, speaking about cultural heritage, tangible and intangible, means engaging with a profound transformation. Artificial Intelligence (AI), Digital Twins, cloud platforms and FAIR (Findable, Accessible, Interoperable, Reusable) data infrastructures are reshaping the ways we document, interpret and protect heritage, aligning with emerging agendas on sustainability, risk management and responsible innovation.

The joint 4th GEORES and 10th Arqueológica 2.0 Symposium, organized by CHEDAR (Cultural Heritage Digitalization and Resilience) project and supported by ICOMOS Italia (International Council on Monuments and Sites), and CIPA-Heritage Documentation (ICOMOS International Scientific Committee), positions itself as a strategic laboratory: three days to outline a shared roadmap toward a coherent and sustainable digital ecosystem for heritage, integrating research, advanced training and long-term policy.

In line with CHEDAR's mission, focused on 3D digitization, Digital Twins, AI and eXtended Reality for risk management, the Symposium invites participants to conceive Cultural Heritage as a dynamic relational system rather than a static collection of objects.

A handwritten signature in black ink, appearing to read 'Grazia Tucci', with a stylized, flowing script.

Grazia Tucci
Conference Chair



Beyond the Replica

Michelangelo's David: Light, Data and Materiality

Photographs by Massimo Sestini

In 2021, a full-scale reproduction of **Michelangelo's David** embarked on an extraordinary journey to the Italian Pavilion at **Expo 2020 Dubai**. The project brought together ultra-high-resolution 3D recording, scientific research, digital modelling, additive manufacturing, conservation and traditional craftsmanship, demonstrating how digital technologies have become essential tools for documenting, understanding and preserving cultural heritage.

Knowledge comes before the replica. Digital recording creates a high-resolution record that supports research, conservation and public access. The physical reproduction is only one possible outcome of a much broader process of documentation, analysis and knowledge creation.

Massimo Sestini's photographs take visitors behind the scenes of one of the most significant projects in the digital documentation of Italian cultural heritage. They reveal the expertise and collaboration that made it possible: geomaticians, conservators, engineers, artisans, together with the complex operations of transport and installation. By bringing this usually invisible work into view, Sestini documents not simply the making of a replica, but the collective human and technological endeavour behind it.

The project attracted worldwide attention; at the centre of the Italian Pavilion, visitors encountered Michelangelo's David at eye level, meeting the sculpture's gaze rather than looking up at it. This subtle yet powerful shift transformed the experience of one of the world's most celebrated masterpieces, demonstrating how innovation can renew the ways we interpret and engage with cultural heritage while prompting reflection on perception, authenticity and the relationship between original and replica.

The Expo Dubai project became the starting point for **CHEDAR – Cultural Heritage Digitalization and Resilience**, a research and advanced training initiative dedicated to advancing the digital documentation of cultural heritage. Sestini's photographs preserve the visual memory of that experience, recording the moment when the digital recording of **Michelangelo's David** became not only an exhibition, but the foundation for new research, collaborations and future applications.

MASSIMO SESTINI (Prato, 1963) is one of Italy's leading photojournalists and an internationally acclaimed visual storyteller. Over more than four decades, his work has documented Italian and global history through an extraordinary

combination of investigative reporting, technological innovation and visual creativity. After his debut with the exhibition *A Seventeen-Year-Old and His Lens* (Florence, 1980), Sestini quickly established himself through a series of exclusive scoops, ranging from politics and organised crime to major national tragedies. His photographs have appeared on the front pages of leading newspapers and magazines worldwide.

A pioneer of aerial photography, Sestini has developed a distinctive visual language that offers original perspectives on major events, including the Moby Prince disaster, the assassinations of judges Giovanni Falcone and Paolo Borsellino, the Great Jubilee of 2000, the G8 Summit in Genoa, and the funeral of Pope John Paul II. Alongside his news reporting, he has portrayed leading figures in politics, business, culture and entertainment, and since 2007 has collaborated extensively with Italian public institutions and the armed forces. In 2014, while embedded aboard the Italian Navy frigate *Carlo Bergamini* during Operation Mare Nostrum, Sestini photographed a crowded migrant boat from directly overhead. The image received the **2015 World Press Photo Award** in the General News category and became one of the defining photographs of the European migration crisis, leading to the long-term project *Where Are You*, developed with *National Geographic*.

His aerial vision also inspired the exhibition Italy: **Horizons from Police Helicopters**, inaugurated at the Quirinale Palace in 2016 and later presented internationally. Known for working in extreme environments - from military helicopters and naval operations to disaster zones and conflict areas - Sestini combines technical mastery with a distinctive visual language. His photographs reveal the relationship between people, landscape and history through unexpected perspectives. In 2018, a major selection of his aerial work was published in *The Air of Time* (Contrasto), offering a unique visual narrative of four decades of Italian history seen from above.

CHEDAR (Cultural Heritage Digitalization And Resilience) is a project of relevant international interest promoted under the "Legacy Expo 2020 Dubai" program (Art. 25-ter of D.L. 152/2021 - PNRR) and approved by the Italian Ministry of Universities and Research (MUR) by Decree No. 237 of 27.12.2023.

The project "Michelangelo's David: 3D Reproduction of the Renaissance Icon for the Italy Pavilion at Expo 2020 Dubai" was carried out pursuant to the Institutional Cooperation Agreement under Article 15 of Italian Law No. 241/1990 between the Commissioner General's Office for Italy at Expo 2020 Dubai and the Department of Civil and Environmental Engineering of the University of Florence; protocol No. COMEXPO2020/01212 of 30 October 2020.



WEDNESDAY 26th

ISTITUTO DEGLI INNOCENTI

13:30-14.30

REGISTRATION

14.30-16.15

OPENING CEREMONY

Institutional Greetings

University of Florence

Debora Berti, Vice-Rector for Research

Istituto Geografico Militare (IGM)

Major General Luigi Postiglione, Commander

CIPA Heritage Documentation

Fulvio Rinaudo, President

ICOMOS Italia

Maurizio Di Stefano, President

SIRA - Società Italiana per il Restauro dell'Architettura

Renata Picone, President

AUTeC – Associazione Universitari di Topografia e Cartografia

Stefano Gandolfi, Coordinator

Digital Ecosystems for Heritage 4.0

Grazia Tucci, Conference Chair and Director of the CHEDAR Project

Presentation of the CHEDAR Challenge and the A. Pericoli Award

16.15-16.30

Sponsor Presentation



WEDNESDAY 26th

ISTITUTO DEGLI INNOCENTI

16.30-17.00

IMMERSIVE EXPERIENCE

**Developed by MezzoForte in collaboration with
Federal University of Ceará (UFC), Brazil**

17.00-17.30

KEYNOTE

**Urban Digital Twins for Climate-Resilient Cities:
Real-Time Flood Risk Assessment, Systemic
Resilience, and Adaptation Planning**

Jürgen Stamm

17.30-18.00

KEYNOTE

**Protection and Management of Cultural Heritage
in Ukraine Amidst the Ongoing War**

Chiara Dezzi Bardeschi

18.00-19.00

SPECIAL SESSION

**The Arno River and the 60th Anniversary
of the 1966 Flood**

Exploring how digital documentation, risk monitoring,
and resilient strategies can transform the memory
of the 1966 flood into a framework for awareness,
preparedness, and long-term heritage resilience.



WEDNESDAY 26th

ISTITUTO DEGLI INNOCENTI

Flood Risk Management in Tuscany Region

Giovanni Massini, Regione Toscana

**From the International Framework to the Local Context:
Risk Management in the UNESCO World Heritage Site of
the Historic Centre of Florence**

*Carlo Francini, Comune di Firenze, Gaia Vannucci,
University of Florence*

**Heritage Cities and Floods: the Exemplary Case of
Florence**

Fabio Castelli, Chiara Arrighi, University of Florence

**Rivers, Cities and Heritage: Building Digital Ecosystems
for Resilient Communities**

Grazia Tucci, Adele Meucci, University of Florence

19.00

Welcome Cocktail



THURSDAY 27th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

IMPORTANT – IGM ACCESS

A valid identity document is required for entry and must be left at the security desk during your visit. Please remember to bring a valid ID with you. Please note that Wi-Fi is not available at the IGM. Participants are advised to use their own mobile data connection.

9.00-9.30

IGM - PLENARY

KEYNOTE

**The Risk of Losing Tangible Cultural Heritage:
Content and Approaches to a Complex Issue
and the Potential Role of Digital Systems**

Donatella Fiorani

9.30-10.00

IGM - PLENARY

KEYNOTE

**What Is the Heritage Digital Twin
and Why It Can Be a Turning Point in the
Digitalisation of Cultural Heritage**

Franco Niccolucci



THURSDAY 27th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

10.00-11.00

IGM

PANEL I - ARTEMIS Project

Reactive Heritage Digital Twins Integrate Semantic Knowledge, Ai, Real-Time Data, and Interoperable Services to Support Intelligent Cultural Heritage Monitoring, Management, and Conservation.

SPEAKERS

Vicky Dritsou (ATHENA Research Center)

Achille Felicetti (ARIADNE)

Miriana Somenzi (ARIADNE)

Aida Himmiche (ARIADNE)

Fady Mena (SmartEducationLab)

Anestis Koutsoudis (ATHENA Research Center)

PANEL CHAIR

Claudio Prandoni

10.00-11.00

IGM

POSTER SESSION

CHAIR: N. Bruno

11.00-11.30

IGM

Coffee Break



THURSDAY 27th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

11.30-13.30

IGM

TECHNICAL SESSION DT-1

**Digital Twins and Computational Realities:
Beyond 3D Modelling**

SESSION CHAIRS: T. Luhmann, J. L. Lerma García

Digital Twins in Cultural Heritage: Living Systems or Data
Repositories? HBIM as a Framework for Lifecycle Heritage
Management

N. Monticelli

Bridging Gaps in Digital Technologies and Institutional Strategies for
Urban Heritage

G. Rizzoli, R. Roversi

A Cloud-native Ecosystem for Cultural Heritage Digital Services

*A. Costantini, A. Bombini, F. Sinisi, M. Raffaelli, A. Sordini, L. Pezzati,
L. Dell'Agnello, F. Taccetti*

A Data-Driven Scan-to-Action Digital Twin Framework for Heritage
Conservation in the Middle East

M. Chalhoub, S. Younan, F. Fassi

Reconstructing Khmer Heritage in the Digital Realm - Efficient 3D
Documentation and Integrated Data Systems

I. Shimoda, T. Oishi, W. Chen, L. Kajiwarra

Bridging the Gap Between 3D Modelling and Digital Twins. The Case
of the Castle of Moglena

E. Psourouki, S. Zarkada, S. Tapeinaki, E. Koutros, A. Georgopoulos



THURSDAY 27th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

From High-Resolution Geomatic Survey to Heritage Digital Model:
An Evolving Infrastructure for the Marsili Collection at the Bologna
University Library

G. Fiorini, A. Forte, P. Lombardo, F. Citti, G. Bitelli

Unveiling Heritage: Building the Pueblo de Esquivel Digital Twin with
Web HBIM-HGIS

E. Dezen Kempter

11.30-13.30

RETTORATO

TECHNICAL SESSION AI-1

AI, Governance and Critical Futures of Cultural Heritage: Trust, Bias and Accountability

SESSION CHAIRS: *G. Toubekis, M. Duong*

Contextual AI Ethical Frameworks in Heritage Conservation.
A Preliminary Study of International Regulatory Frameworks
Y. Huang

Considerations for Accountable AI in Cultural Heritage
Documentation. Toward FAIR Digital Objects for the European
Collaborative Cloud
G. Toubekis, L. Kong, Z. Boukhers

From Report to Inquiry: Governing Generative AI Insights in Heritage
Significance Assessment
Y. Alef, Y. Shafriri, U. Berger

Encoding Accountability: Authority Files, URN Governance, and AI-
Ready. Data Architecture in the Artsakh Epigraphy Atlas
*H. Tamrazyan, N. Sarvazyan, A. Harutyunyan, N. Meloyan,
Y. Harutyunyan, Z. Grigoryan, N. Galstyan*



THURSDAY 27th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

Ontology-Based Enrichment of IFC Models for Archaeological Information Systems - The Case of a Roman Nymphaeum in Santa Maria Capua Vetere

V. Cera, S. Gonizzi Barsanti, M. Capasso

Zero-Shot 2D-to-3D Semantic Projection for Heritage Scan-to-HBIM Workflows

T. Fernandes, G. Cerveira, R. Rodrigues, N. Correia, M. Vilarigues

AI for Stone Deterioration Mapping: Developing LIMAP - Limestone Intelligent Mapping and Automated Process

E. Giusta, C. Darmanin, M. Galea, K. Abela

AI-Assisted Condition Monitoring of Designated Built Heritage in a Depopulating Society: Accountability Gaps and the Expert-in-the-Loop Model

H. Ikawa

13.30-14.30

IGM

Light Lunch

14.30-16.30

IGM

TECHNICAL SESSION DT-2

**Digital Twins and Computational Realities:
Beyond 3D Modelling**

SESSION CHAIRS: D. Skarlatos, R. Okazaki

A possible Digital Twin for the Dome of Santa Maria del Fiore in Florence: from Static Monitoring to Conservation

M. Parente, N. Bruno, F. Ottoni



THURSDAY 27th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

Non-Invasive Surveys for Heritage Conservation: Integrated 3D Point Clouds and GPR Analysis in the Church of Santa Prisca

S. Cigognetti, M. Astrella

Mapping Archaeological Sites Without UAVs: Optimising TLS and SLAM-based Point Clouds

A. Spanò G. Patrucco, B. Kong

Use of SLAM Technology and Ai-Based Solutions for the Valorisation of Ch in Critical Areas

Z. Wu, A. Spanò, G. Patrucco, F. Matrone, A. Lingua, C. Imbriani

Comparative Evaluation of Photogrammetric Software on the Plaster Relief “Incontro tra Salomone e la Regina di Saba” from the Plaster Cast of the “Porta del Paradiso”

G. Vaccari, F. Niccolai, J. Ciani

Comparison of Static and Mobile Laser Scanning for Bim Modeling of Complex Historical Roof Constructions

T. Luhmann, M. Chizhova, S. Klaus, N. Luhmann

A Multi-Scale Framework for Digital Documentation and Virtualisation of Architectural Heritage

K. Kohara, R. Saiki, Y. Hori

Time-Series 3D Laser Scanning for Deterioration Assessment of Cultural Heritage Assets

T. Oishi, R. Ishikawa



THURSDAY 27th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

14.30-16.30

RETTORATO

TECHNICAL SESSION AI-2

AI, Governance and Critical Futures of Cultural Heritage: Trust, Bias and Accountability

SESSION CHAIRS: A. Adami, M. Hess

AI/ML-Based Classification of Structural Pathologies in Heritage Buildings Damage: Ontology-based Framework for Culturally Sensitive Conservation

S. Rihal

ATHENA: Archaeological Texture-aware Heritage Enhancement via Neural Inpainting Architecture - A Reproducible End-to-End Pipeline for Ancient Greek Pottery Restoration

V. Tsavalias, C. Volioti, A. Ampatzoglou

Adaptive 3D Surfaces Supporting Vaults Deformation Learning: a Proposal of Ai-Powered Workflow

G. Sammartano, G. Patrucco, M. Previtali, A. Monaco, L. Facconi

Knowledge, "trustworthy" Artificial Intelligence, and Large-Scale Predictive Investigations - Theory and Application: the Case of the Twelve Churches Between Carnia and Upper Friuli

E. Canevese, M. Baccichet, P. Salonia

Heritage-Preserving Generative AI for Craftsmanship

E. Collini, L. Donati, A. Monti, P. Nesi, N. Mitolo

Beyond Digital Replication: Constructing Spatial Genes of Digital Rural Heritage with Public Perception

T. Qi, Y. Zhou, Z. Liu

Repatriation Without the Object - 3D Replicas and the Question of Return

Š. Vyhnánková



THURSDAY 27th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

16.30-17.00

IGM

Coffee Break

17.00-19.00

IGM

TECHNICAL SESSION DT-3

**Digital Twins and Computational Realities:
Beyond 3D Modelling**

SESSION CHAIRS: G. Patrucco, D. Pritchard

Crack Identification and Mapping in Churches: A Foundation Model Approach Using Different Imagery

M. Bozzano, R. Ravanelli, S. Cattari, B. Federici

Paradata for Interactive Architectural Agent - BIM and LLM Deepen Understanding of Historical Buildings

T. Ishizawa

Integrated Digital Ecosystems for Heritage Risk Governance - Multi-sensor Monitoring of the Neapolis Archaeological Park and the Island of Thapsos in Syracuse (2023-2025)

I. Tranchina, G. Tranchina, P. Tranchina

Emergency Documentation of Inhabited Heritage in Addis Ababa under Redevelopment Pressure

S. Sugiyama, T. Asano, R. Okazaki, I. Shimizu, T. Girmay

Airborne and Terrestrial LiDAR for the Virtual Transformation of an Indigenous Padain Settlement in Taiwan: A 1975 Baseline to Pre- and Post-Typhoon Morakot Context (1975-2024)

H. Lu, L. Yao



THURSDAY 27th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

Echoes of Identity: Spatio-Acoustical Investigations of Medieval Armenian Sacred Sites

A. Sylvia, S. Gardner, A. Papikyan, K. Sharma, T. Margaryan, A. Andrianov, E. Bourdeau, N. Sarvazyan

19th Century Battlefield Digital Twins - Applying Virtual Reality in Enhancing Living History and Historical Commemorations for Battle Sites embedded in the Metro Manila Urban Fabric

M. Feliciano, A. Corpuz, D. Magallona, J. Lee

Contextual Differences and Paradigm Reconstruction: Localizing Digital Twin Technology for Huizhou Cultural Heritage Conservation in China

D. Ma, J. Xu, A. Fu

17.00-19.00

RETTORATO

TECHNICAL SESSION RIS-1

Heritage Under Pressure: Risk, Monitoring and Resilience Strategies

SESSION CHAIRS: E. Rosina, A. Rodriguez Miranda

Risk monitoring and Assessment for Strategical Resilience of Built Cultural Heritage

A. Vaccariello

Exploring Imaging Modalities and Treatments for AI-Assisted Built Heritage Inspection

S. Boutet, P. Hallot

GIS Analysis for Site-Scale Climate Risk Baselines - The Industrial Heritage Landscape of Nyhavna

B. Nanaiah, S. Lazarevic, A. Gustavsen



THURSDAY 27th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

3D View Technologies for Monitoring and Analysis of Tangible Cultural Heritage

T. Ziziunas, D. Noreika

Reconsidering Photogrammetry as a Tool for Archaeological Site Monitoring

K. Yamafune

Flood risk assessment for Turin's built heritage: Integrating Italian Risk Map-Based Vulnerability with Multi-Source Data for Exposure Analysis

F. Ravizza, A. Spanò, C. Cacace

Recording and Analysis of Complex Geometries of Archeological Features - Case study of Tomb 7 at Tombs of The Kings in Cyprus

S. Mahmoudi, D. Oreni, B. Cuca, A. Agapiou

Documentation of Architectural Heritage and Communities in Armenian District, Addis Ababa

T. Asano, S. Sugiyama, R. Okazaki, I. Shimizu

20.30

Social Dinner - Golden View

Via de' Bardi, 58R - 50125 Florence, Italy



FRIDAY 28th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

IMPORTANT – IGM ACCESS

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9.00-9.30

IGM - PLENARY

KEYNOTE

Heritage 4.0: Can We Trust Artificial Intelligence?

Mario De Caro

9.30-11.00

IGM

TECHNICAL SESSION SKI

Skills for Heritage 4.0: Training, New Professions and Knowledge Transmission

SESSION CHAIRS: K. Van Daele, G. Malandrino

A Bottom-Up Approach for Weaving Cultural Heritage Datasets on Open Science Infrastructures

A. Rodriguez Miranda, J. Korro, J. Valle-Melón, A. Macías Redondo

The ArmEpiC Ecosystem as a Model for Interdisciplinary Training in Digital Epigraphy

H. Tamrazyan, N. Sarvazyan, A. Harutyunyan



FRIDAY 28th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

The Escuela de Primavera – Levantar la Muralla en Cartagena:
Integrating Training and Reality-Based 3D Recording for
Cultural Heritage Documentation

G. Patrucco, F. Chiabrando, A. Dameri, P. Mellano

Mobile SLAM for Archaeology: Testing Performance at the Tombs of
the Kings, Paphos

G. Kafataris, D. Skarlatos, M. Vlachos, A. Agapiou

A GIS-Based Spatial Analysis of Hopewell Earthworks:
Reconstructing Cultural Landscapes from Historical Data

E. Brabec, S. Nusair, E. Gunther

9.30-11.00

RETTORATO

TECHNICAL SESSION RIS-2

Heritage Under Pressure: Risk, Monitoring and Resilience Strategies

SESSION CHAIRS: C. Riminesi, P. Glisenti

LiDAR-Based Temporal Monitoring and Change Detection of Petra's
Rock-Cut Heritage

S. Alathamneh, J. Liu, D. Willkens, M. Viñals, S. Kramer

Integrated Static and Mobile 3D Surveying: Case Study of Post-Flood
Documentation in Paiporta and Letur, Spain

*D. Pritchard, D. Belkouri, C. Moreno-García, M. Martinez-Sanchez,
C. Bianchini, M. Attenni, M. Griffo*

Mitigating the Urban Heat Island in a Cultural Heritage City:
A Remote Sensing-based Modeling Approach in Florence-Italy

H. Esmaeilian Toussi, F. Di Ciaccio, E. Parisi, G. Tucci, E. Rosina



FRIDAY 28th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

Heritage 4.0 for Climate-Resilient Coastal Heritage:
Risk Mapping of Trabzon's Historic Coastal Cultural Landscape
S. Gündoğdu, M. Öksüzoglu

Multi-sensor UAV-based Approach for Alpine Landscape Heritage
Detection and Climate Change Adaptation
V. Santoro

The Rice Field and the Canal -Graph-based Failure Propagation
Modelling in Historic Landscape Assets under Drought Stress
L. Serra Bellini, A. Spanò, B. Barroca

11.00-11.30

IGM

Coffee Break

11.30-12.00

IGM - PLENARY

KEYNOTE

**Mediterranean Cultural Heritage in the Age of AI
and Earth Observation**

Rosa Lasaponara

12.00-12.45

IGM

**PANEL II - CHEDAR Project
From Dubai to the World**

Heritage, Knowledge and New International Partnerships.
Exploring Concrete International Cooperation in Heritage,
Education, Digital Technologies, and Cultural Resilience.



FRIDAY 28th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

SPEAKERS

Ona Vileikis (CIPA Heritage Documentation)

Hirofumi Ikawa (Agency for Cultural Affairs, Government of Japan / CIPA Japan)

Gaetano Malandrino (Academy of Fine Arts of Carrara)

Michel Chalhoub (CEO – DiSTRUCT, Lebanon)

Giorgio Sobrà (Istituto Centrale per il Restauro – ICR)

PANEL CHAIR

Paolo Glisenti

12.00-13.30

IGM

POSTER SESSION

CHAIR: G. Patrucco

12.45-13.30

IGM

PANEL III

Heritage is Not Engineering: Rethinking What Makes a Digital Twin Work

Rethinking Digital Twins for Cultural Heritage Through Values, Interpretation, Governance, and Heritage-Specific Requirements.

SPEAKERS

Georgios Toubekis (Fraunhofer FIT, Germany)

Koen Van Daele (Flanders Heritage Agency, Belgium)



FRIDAY 28th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

Tomas Barnas (Overhead4D, Slovakia)
Ona Vileikis (CIPA Heritage Documentation)

PANEL CHAIR

Alessandro Conti

13.30-14.30

IGM

Light Lunch

14.30-16.30

RETTORATO

TECHNICAL SESSION MUS

**Museums After Digital: Accessibility, Hybrid
Experiences and New Audiences**

SESSION CHAIRS: E. Brabec, P. Asproni

Experiential Digital Twins (XDT): A Framework for Immersive and
Sustainable Heritage Tourism

M. Vilarigues, N. Correia, C. Machado

Designing Hybrid Accessibility: XR Strategies and Interaction Design
for Future Museums. A Comparative Analysis of the PERCEIVE,
BrancacciPOV, and Aldrovandi Cases.

F. Bonifazi, I. Cerato, M. Massidda, S. Pescarin

From Virtual Tour (VT) to Digital Ecosystem for Hybrid Maritime
Heritage Experience Development and Evaluation

J. Liu, D. Willkens, S. Alathamneh, S. Kramer



FRIDAY 28th

ISTITUTO GEOGRAFICO MILITARE / RETTORATO

An XR-enabled Agile Renewal Framework for Spatial Value
Revitalization of Minor Heritage - A Case Study of a Hakka
Enclosed House in Lingnan, China

C. Zhou, Z. Zhong, S. Han

Digital Storytelling and Heritage Walks: an Accessible and
Participatory Pathway Narrative Model for the Angevin Castle of
Gaeta

L. Saturnino

New Objects of Exhibition Archives: A Study on Archiving Museum
Public Participation Data

T. Qi, Z. Liu, Y. Zhou

16.30-18.00

RETTORATO

CLOSING CEREMONY

**A. Pericoli award for CHEDAR Challenge
Best Poster Award**

Final statements and announcements of future events and initiatives.



POSTER SESSION PROGRAMME

THURSDAY 27th 10.00-11.00

FRIDAY 28th 12.00-13.30

ISTITUTO GEOGRAFICO MILITARE

TECHNICAL SESSION DT-1

Digital Twins and Computational Realities: Beyond 3D Modelling

LPSAM3 - A Domain-Adaptive Vision Foundation Model for the High-Precision Semantic Segmentation of Liao Dynasty Pagodas

Y. Xu, X. Zhang, W. Chen, Y. Yang, H. Ma, Z. Wang, X. Yan

Semantic Dimensions of Heritage: Advanced HBIM and Data Integration for Cultural Conservation

R. Fernandes Dionizio, S. Walbe Ornstein, F. Lopes de Oliveira

HERO for Reusable Semantic Assets in Heritage Digital Twin Contexts

Z. Liu, D. Willkens, X. Meng, B. Li

Application of the Scan-to-BIM Methodology in the Archaeological Context: The Case Study of the Segesta Site (Italy)

G. Mineo, M. La Guardia, M. Lo Brutto

Digital twin: A Systematic Review for the Governance of Historical Built Heritage in Urban Context

J. Hendy, S. Buglisi

Photogrammetric Processes within the DiViAS Project - Digitisation, Visualisation and Analysis of Collection Items

T. Luhmann, S. Albers, T. Sieberth, D. Freist, U. Warnke



POSTER SESSION PROGRAMME

THURSDAY 27th 10.00-11.00

FRIDAY 28th 12.00-13.30

ISTITUTO GEOGRAFICO MILITARE

TECHNICAL SESSION DT-1

The Use Of Digital Twin For Lost Heritage Conservation In Post Conflict Societies

S. Gunay

Cognitive Digital Twin for Museum Repositories: Risk Simulation and Planned Conservation

M. Montuori

Mapping heritage: a Remote Sensing and Gis-Based Methodology for The Inventory of Undocumented Dry Stone Heritage in the Doukkala Region, Morocco

J. el Guendissi

Towards a Reactive Digital Twin for Cultural Heritage Conservation: The Case Study of the Pulpit of Giovanni Pisano

M. Betti, A. Conti, F. Di Ciaccio, L. Fiorini, S. Monchetti, G. Tucci, B. Howe, A. Cojocar



POSTER SESSION PROGRAMME

THURSDAY 27th 10.00-11.00

FRIDAY 28th 12.00-13.30

ISTITUTO GEOGRAFICO MILITARE

TECHNICAL SESSION AI-1

AI, Governance and Critical Futures of Cultural Heritage: Trust, Bias and Accountability

Predictive Digital Documentation of Archaeological Sites Using UAVs and Remote Sensing Technologies: A Case Study of the 'Arj Archaeological Site in Eastern Saudi Arabia

K. Alqahtani

AI-Assistive Tool for Sustainable Renovation - An AI-Driven Tool Integrating HBIM, LCA, LLM, and Python Scripting to Optimize Material Choices in Existing Buildings

A. Adami, D. Treccani, H. Adel Ali Mousa

Redefining Authenticity in AI-Assisted Cultural Heritage Restoration: A Systematic Literature Review

C. Yu

Artificial Intelligence Model for Correlating Climate Change and Heritage Material Weathering

A. Cormier, D. Roqui, J. Vallet, F. Surma, N. Grozavu, A. Bourges

The Knowledge Backbone of Heritage 4.0: An Ontology-Driven Knowledge Graph for Liao Dynasty Masonry Pagodas

Y. Xu, Z. Wang, X. Yan, X. Zhang, Y. Zhang, Y. Yang

Standardisation Without Erasure: Building a SKOS Vocabulary for Ukrainian Epigraphic Heritage and the Governance of Cultural Metadata

H. Tamrazyan



POSTER SESSION PROGRAMME

THURSDAY 27th 10.00-11.00

FRIDAY 28th 12.00-13.30

ISTITUTO GEOGRAFICO MILITARE

TECHNICAL SESSION AI-1

Collections Intelligence System (CIS) — A Governance-Oriented Framework for Risk-Aware Private Art Collections

S. Doherty

AI-Assisted Semantic Enrichment and Attribute Generation for HBIM Archaeological Documentation

D. Jovanovic, D. Oreni

When Algorithms Interpret the Past: Trust, Bias and Epistemic Authority in AI-Driven Cultural Heritage Analysis

Z. Stamati, A. Georgopoulos

Documentation Standards as Governance Infrastructure: AI Amplification Risks in Heritage 4.0

S. Yin

Data as Evidence: Trustworthy AI and Artistic Practices for Cultural Heritage

D. Luzzi, G. Tucci



POSTER SESSION PROGRAMME

THURSDAY 27th 10.00-11.00

FRIDAY 28th 12.00-13.30

ISTITUTO GEOGRAFICO MILITARE

TECHNICAL SESSION RIS-2

Heritage Under Pressure: Risk, Monitoring and Resilience Strategies

Enhancing Reproducibility and Parameter Transparency in GIS-Based Archaeological Predictive Modelling: A ROC-Validated Sensitivity Framework for Digital Heritage Ecosystems

S. Ullah, N. Ahmad, A. Samad, R. Young, P. Newson

From Field Photos to Preservation Knowledge: A Vision-Assisted Wood Deterioration Glossary for Heritage Documentation

Y. Lin, B. Li, D. Willkens

Quantifying Biocultural Values and Assessing Conservation Risks in the Fengyan Terraces

S. Liu, Y. Chen, Z. Liu, L. Wang, Z. Zhang

Multi-Source Data-Driven Spatial Perception Assessment and Refined Renewal: Evidence from Historic Districts in Wuhan

Z. Zhang, S. Liu, L. Wang

SENNSE: First-Year Deployment of the IoT Monitoring Platform across Two Heterogeneous Cultural Heritage Sites

D. Zecca, F. Taurino, N. Najafiragheb, A. Pandurino, A. Bucciario

Geomatic Methods Supporting Structural Investigations and Restoration of Historic Buildings in Developing Countries: the Case of Guenete Leul Palace

G. Patrucco, E. Colucci, M. Fallah, D. Gino, F. Rinaudo, R. Rudiero



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THURSDAY 27th 10.00-11.00

FRIDAY 28th 12.00-13.30

ISTITUTO GEOGRAFICO MILITARE

TECHNICAL SESSION RIS-2

Semi-automated Tools for Investigating Masonry Construction Techniques: the Case of the “de li Beli Miri” Tower in Teglio

V. Nannei, V. Paris, D. Prati, G. Mirabella Roberti

A Digital Ecosystem for a Fortified Heritage Landscape and Multi-Hazard Risk in the L'Aquila Area: UAV Photogrammetry, GIS Spatial Analysis, and Physics-Based Seismic Simulations

E. Stagnini, F. Di Michele, D. Pera, R. Aloisio

Terrestrial Laser Scanning for Authenticity Preservation and Risk Monitoring of Cultural Heritage: The Case of the Church of St. Transfiguration in Pomorie, Bulgaria

G. Antova, E. Kaleva

Integrating GIS Databases and LiDAR-Based 3D Documentation for Earthquake Preparedness and Resilience in Industrial Heritage Sites: The Romangalle Silk Factory, Bursa

F. Kivilcim Corakbas, T. Kızılkışak, E. Acar, B. Dogan, İ. Gurtekin, M. Celik, D. Akansu



POSTER SESSION PROGRAMME

THURSDAY 27th 10.00-11.00

FRIDAY 28th 12.00-13.30

ISTITUTO GEOGRAFICO MILITARE

TECHNICAL SESSION SKI

Skills for Heritage 4.0: Training, New Professions and Knowledge Transmission

A Non-Destructive Investigation of Ancient Japanese Buddhist Temples (6th–8th Centuries) Using Ground-Penetrating Radar (GPR)
W. Takahshi

The Documentation Process of a Unique Built Heritage Site: the “Ideal City” of La Scarzuola. Challenges, Strategies and Lessons Learned
H. Modaberi, A. Martino, L. Teppati Lose'

TECHNICAL SESSION MUS

Museums After Digital: Accessibility, Hybrid Experiences and New Audiences

App Pavlos: An AR-Enabled Mobile Digital Ecosystem for Accessible Religious Heritage Tourism in Pieria
I. Skalidi, Z. Tsifodimou, A. Stamou, T. Mone, E. Stylianidis

From Description to Storytelling as Mediation — Design Framework for Inclusive Digital Archives of Industrial Heritage for New Audiences
F. Softa

SOUND OVERFLOWS

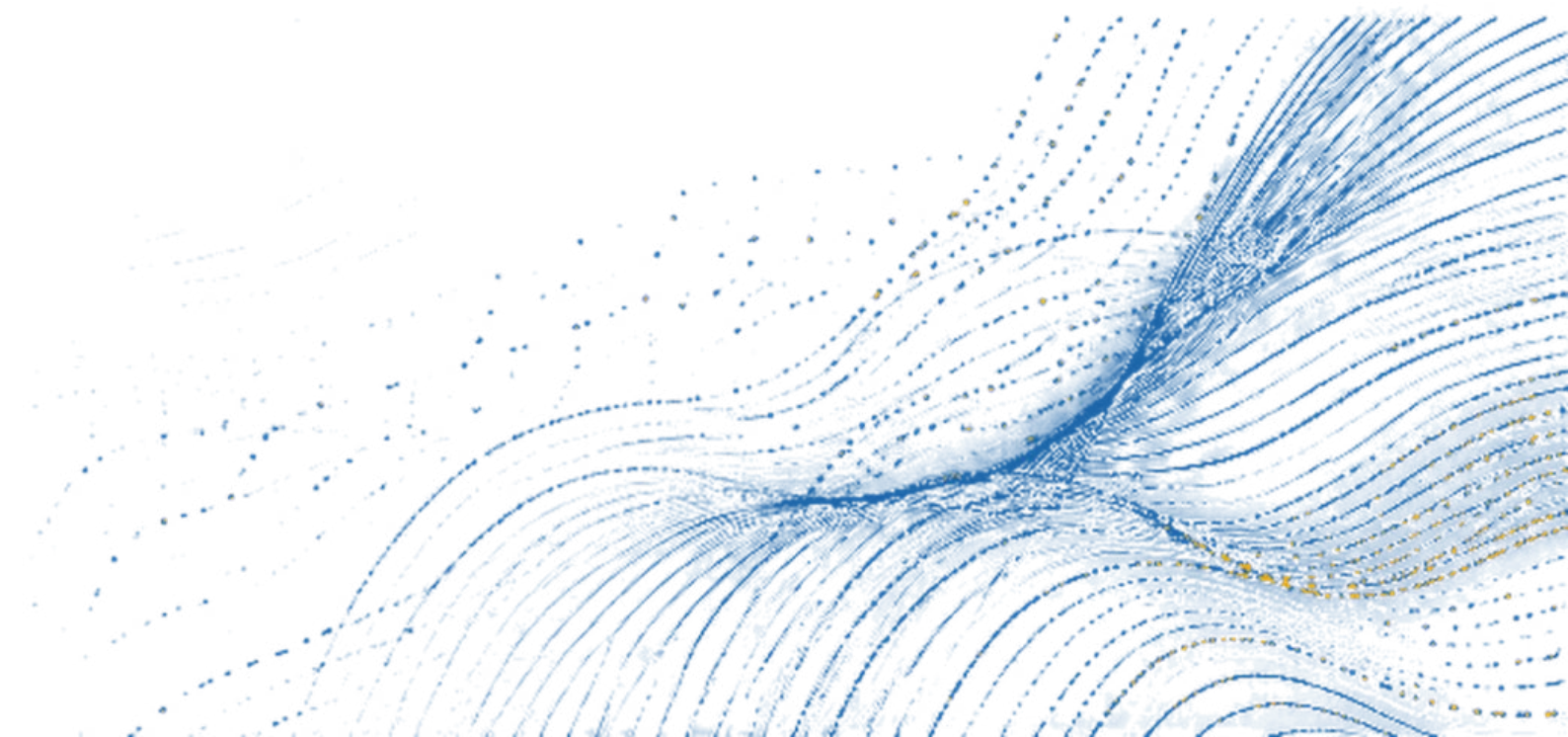
Created especially for Digital Ecosystems for Heritage 4.0, Sound Overflows explores how sound and spatial perception can transform the way cultural heritage is encountered and interpreted.

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Sound, space and perception in a new encounter with cultural heritage.

Conceived as a site-specific experience, it invites visitors to move beyond conventional forms of representation and to engage with heritage through presence, listening and perception.

The experience brings together creative practice and technological experimentation, creating a dialogue between the physical environment and an evolving digital dimension.



SOUND OVERFLOWS

A DIFFERENT WAY OF EXPERIENCING HERITAGE

An immersive environment where listening becomes a form of exploration.

Rather than presenting digital content as something separate from the physical space, the experience creates an additional perceptual layer around it.

Sound, spatial relationships and immersive technologies contribute to an environment that visitors can explore intuitively, encouraging new connections between place, memory, interpretation and sensory experience.

The installation reflects one of the central themes of the Symposium: how emerging technologies can extend access to cultural heritage while preserving the importance of human perception and embodied experience.

CREATED BY



mezzoforte

The power of sound to serve culture and art.

Mezzo Forte is a creative technology studio founded in 2019 by sound designers, sound engineers, developers and researchers with extensive experience in 3D audio, live electronics and spatial sound. Its work focuses on tailor-made immersive and augmented acoustic experiences for museums, cultural spaces, performances, concerts and guided visits, combining original content, sound design and technological development adapted to each context.

IN COLLABORATION WITH

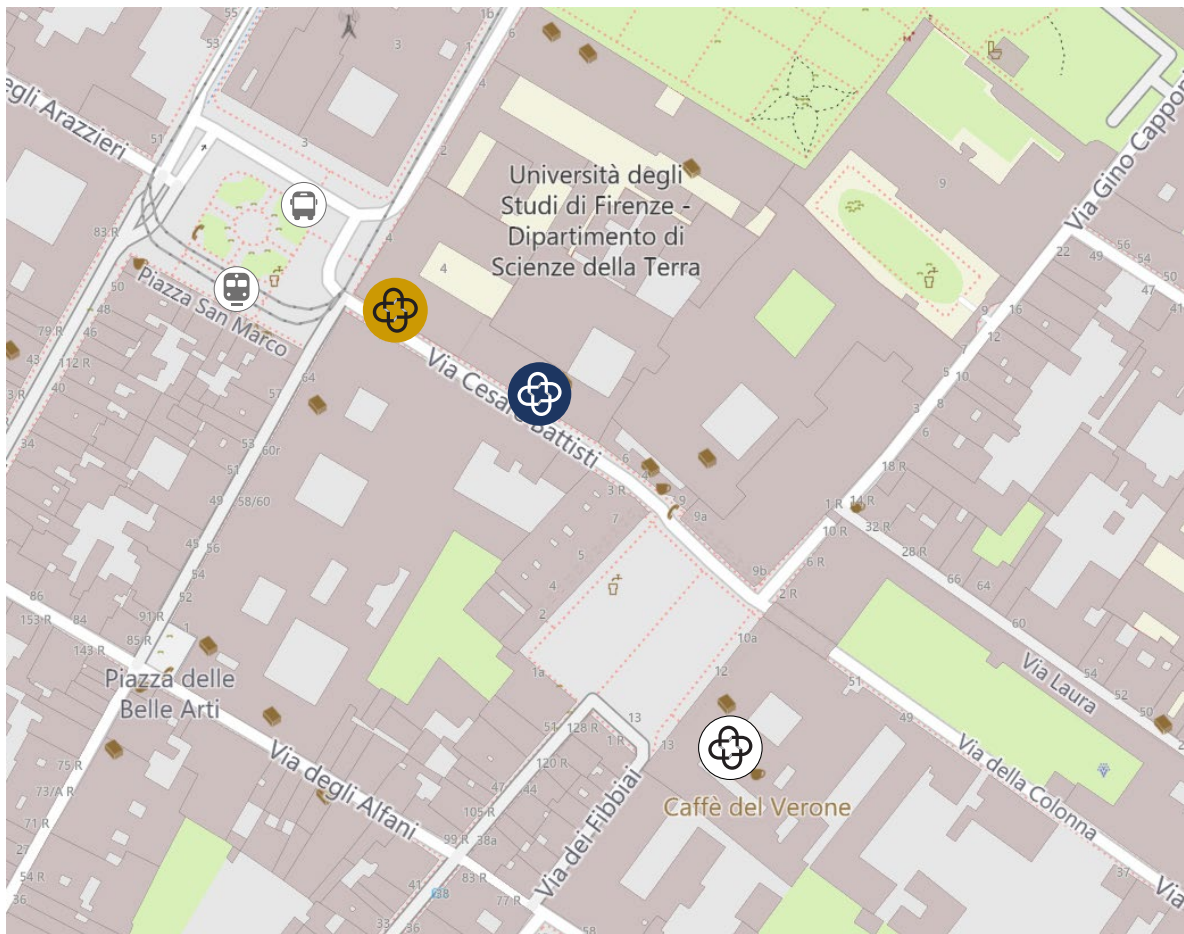


UFC

The Immersive Experience is developed in collaboration with the Federal University of Ceará (UFC), with the scientific contribution of Prof. Esequiel Fernandes Teixeira Mesquita, Coordinator of the Laboratory for Rehabilitation and Sustainability of Constructions (LAREB).

The collaboration brings together creative experimentation and academic research, fostering new approaches to cultural heritage interpretation and experience.

LOCATIONS



Rettorato (Università degli Studi di Firenze)
Piazza di San Marco 4



Istituto Geografico Militare
Via Cesare Battisti 10



Istituto degli Innocenti
Piazza della Santissima Annunziata 12



San Marco Piazza



T2 San Marco Università