

THE CHEDAR PROJECT

LARGE MEDITERRANEAN CULTURAL HERITAGE, A STRATEGIC GLOBAL DIGITAL PROJECT



Cultural Heritage Digitalization and Reconstruction

BY GRAZIA TUCCI,
CHEDAR DIRECTOR



At its core, CHEDAR aims to establish a Research and Advanced Training and Education Centre, envisioned as a nerve center for the convergence of scientific efforts from partner institutions.



The CHEDAR project positions itself within the international landscape as a strategic initiative for the digitization, documentation, and safeguarding of cultural heritage.

It fosters co-designed actions at both national and European levels, while nurturing a new generation of professionals with hybrid expertise – blending humanities, advanced digital technologies, and project development skills – with a particular emphasis on the wider Mediterranean region.

The project recognizes that cultural heritage knowledge and documentation are not mere technical processes, but foundational acts of conservation and transmission. Digital technologies are not optional tools here; they constitute a cognitive and operational infrastructure to address vulnerabilities posed by both natural and anthropogenic factors. Within this framework, the synergy between artisanal know-how

and emerging technologies, including Artificial Intelligence, represents a new methodological paradigm.

Coordinated by the University of Florence, CHEDAR brings together an interdisciplinary network of partners: the Universities of Tuscia, Cassino e Lazio Meridionale, Roma Tre, Sapienza, Campus Bio-Medico, CNR-ISPC, the Academy of Fine Arts of Carrara, ISIA Florence, and the Central Institute for Restoration (ICR).

THE RESEARCH AND ADVANCED TRAINING AND EDUCATION CENTRE - MISSION AND VISION

In a context where cultural heritage is increasingly exposed to environmental risks, conflicts, and poor management, CHEDAR offers a strategic and structured response. Knowledge is the first line of protection, and documentation is its operational tool.

The loss of monuments and heritage sites often outpaces their

documentation, making it urgent to embed documentation into all conservation, monitoring, and management strategies.

The vision of CHEDAR aligns with the Sustainable Development Goals (SDGs) and European guidelines on digital strategy for cultural heritage, aiming to translate these framework into effective, scalable, and replicable actions, grounded in sustainable, interoperable, and shared best practices.

CHEDAR Cultural Heritage Digitization And Reconstruction is funded under the Legacy Expo 2020 Dubai programme (Article 25-ter of Law Decree No. 152/2021 - PNRR) and was formally approved by Ministerial Decree MUR No. 237 dated 27/12/2023.



CHEDAR's mission is to promote a holistic, interdisciplinary approach to heritage safeguarding, integrating 3D digitization, material diagnostics, environmental analysis, and predictive monitoring, including through the use of AI.

These tools will converge in the creation of Heritage Digital Twins—not merely static digital replicas, but dynamic digital resources that are part of a broader sustainable and interconnected cultural ecosystem. This is not a one-off effort, but a strategic, long-term vision.



The digital model of Michelangelo's *Genius of Victory* (Palazzo Vecchio, Florence), created as part of a project focused on research, physical replication, and the promotion of accessibility and inclusion within the museum itineraries of several Florentine museums. Courtesy GeCo Lab

A STRATEGIC FOCUS ON THE WIDER MEDITERRANEAN

CHEDAR identifies the wider Mediterranean as a dynamic and vulnerable cultural space, where heritage preservation intersects with geopolitical, environmental, and social challenges.

Addressing these requires an integrated approach, combining scientific tools with cultural policy strategies. This vision embraces an expanded interpretation of the Mediterranean, aligned with the Mattei Plan, fostering dialogue across regions and disciplines.

Historian Ferdinand Braudel once asked, “What is the Mediterranean? A thousand things at once. Not a landscape, but many landscapes. Not a sea, but a series of seas. Not a civilization, but a sequence of civilizations.” CHEDAR adopts this plural and interconnected perspective.



Top: Section view of the digital model of the dome of the Baptistery of San Giovanni in Florence, highlighting the unghiatore that connect the vault to the roof structure. Courtesy GeCo Lab

Next page: The point cloud model of Palazzo Pitti, showing the Ammannati courtyard and the floor that houses the Gallery of Modern Art. Courtesy GeCo Lab

THE PILLARS OF CHEDAR

CHEDAR’s activities revolve around four thematic pillars, each serving as a foundational axis for project development and inter-partner coordination. Its governance model is inspired by FAIR principles and aligned with international standards to ensure quality, transparency, and sustainability:

1. Documentation and Digitization

Development of advanced solutions for data digitization and management, with a strong focus on interoperability, historical dataset recovery, and AI applications for data analysis and semantic enrichment. Documentation becomes both a preventive strategy and an instrument for proactive conservation.

2. Safeguarding and Conservation

Integration of digital tools and artisanal knowledge toward

sustainable restoration. Conservation is approached as a systemic process, from risk prevention to adaptive management, utilizing green materials and innovative methods drawn from historical practices.

3. Valorisation and Accessibility

Exploration of new modes of heritage engagement through digital design, augmented reality, and inclusive practices. Special attention is paid to the creative reuse of cultural data within the creative industries, enabling accessible narratives and new heritage economies.

4. Climate Change and Risks

Analysis of risk factors and development of predictive models supported by GeoAI and Digital Twin simulations. The aim is to transform risk knowledge into strategic resources for long-term protection and climate adaptation.

STRUCTURE AND ACTIVITIES OF THE CENTRE

CHEDAR is conceived as a permanent laboratory of innovation and training, fostering access to a network of institutional, scientific, and community actors – from heritage authorities to local communities. Its goal is to build a collaborative, impact-oriented ecosystem. Hands-on experience is a cornerstone: CHEDAR promotes labs, on-site conservation sites, and fieldwork-based experimentation, transforming theoretical learning into actionable practice. Education becomes a continuous, place-based learning process rooted in real-world contexts.

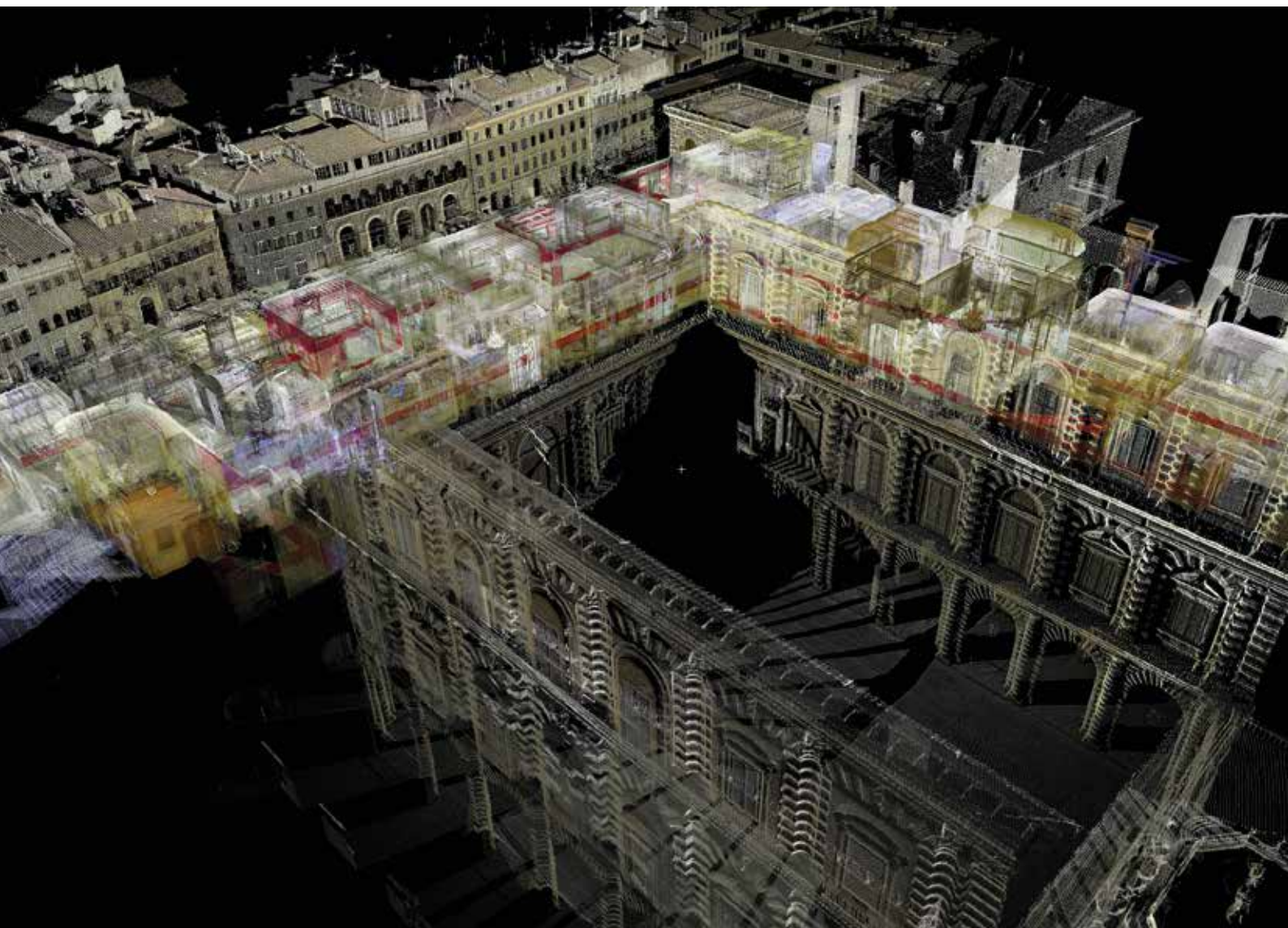
CHEDAR
aspires to become a
cultural and scientific
hub for the regeneration
of heritage, a space for
experimentation and
education, translating
today's challenges
into visions for the
future. Anchored in the
Mediterranean, with a
global outlook.

ADVANCED TRAINING AND EDUCATION

Training is a cross-cutting component of the entire project, aimed at creating new professional profiles capable of managing the digital transformation of the cultural heritage sector.

The educational network involves universities, research centers, and AFAM institutions, with a strong interdisciplinary and international orientation.

The support of ICOMOS Italy and CIPA Heritage Documentation provides further scientific credibility and global recognition.



CHEDARACADEMY MODULAR AND ACCESSIBLE LEARNING PATHS

To meet the need for specialised, interdisciplinary, and accessible training, CHEDARacademy offers a modular portfolio tailored to various skill levels, professional goals, and learning timelines.

MOOC (MASSIVE OPEN ONLINE COURSES)

These remote-access online courses offer both foundational and advanced theoretical knowledge, structured into thematic modules with quizzes and digital badges. Six key domains of digital transformation are addressed:

1. Cultural Heritage & Digital Transformation

A multidisciplinary course offering the tools to plan, implement, and manage sustainable, interoperable digitization projects, with a focus on 3D technologies, digital conservation strategies, and data sharing protocols.

2. Conservation & Sustainable Practices

Diagnostic tools and innovative techniques for the sustainable conservation of materials such as stone, wood, and earth, focusing on risk prevention.

3. Risks, Crises & Resilience

Frameworks and tools to evaluate and respond to natural, anthropogenic, and conflict-related risks, emphasizing resilience and fragile context management.

4. Communication, Interpretation & Inclusion

Exploration of digital storytelling, inclusive museums, and participatory curation, engaging diverse publics in meaningful ways.

5. Policy, World Heritage & Rights

Governance issues related to Outstanding Universal Value (OUV), digital rights, intellectual property, and documentation ethics.

6. Innovation in Materials & Technologies

Emerging solutions such as 3D printing, augmented reality, and their applications in conservation, education, and community engagement.

SPRING/SUMMER/AUTUMN/ WINTER SCHOOLS

In-person training programmes ranging from 6 to 15 days, characterised by an intensive and multidisciplinary approach.

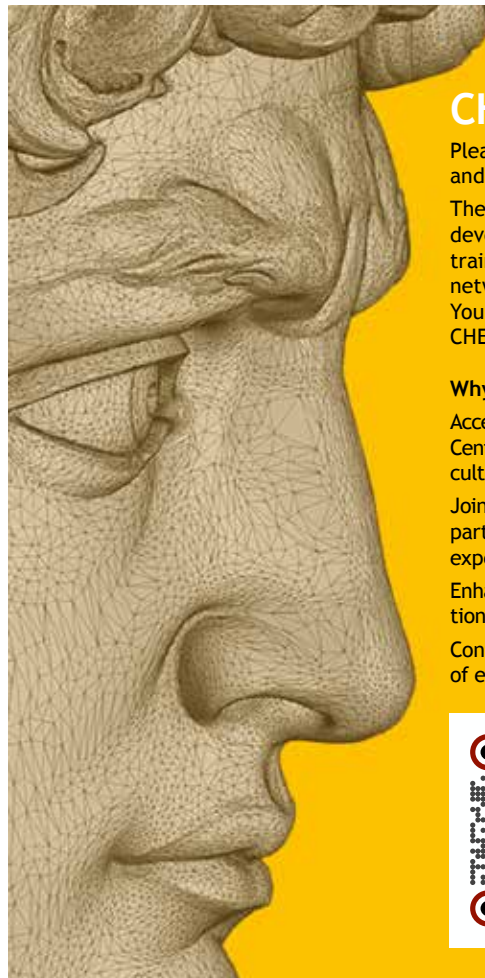
Organised in collaboration with academic and cultural institutions, these schools explore

emerging topics through hands-on workshops, practical activities, and guided visits to cultural sites and institutions. They offer participatory learning experiences combining fieldwork, expert interaction, and structured education in real-life contexts.

WEBINARS

Online training sessions led by national and international experts, dedicated to in-depth exploration of specific topics, case studies, and best practices in conservation, management, and technological innovation applied to cultural heritage.

They offer a flexible and accessible opportunity for ongoing professional development, encouraging dialogue among researchers, professionals, and institutions.



CHEDAR Survey

Please, fill out the questionnaire and join our Community!

The survey will guide the development of tailored training, research, and networking opportunities. Your input will help shape the CHEDAR Project.

Why Participate?

- Access the CHEDAR Research Center, a hub for innovation in cultural heritage.
- Join training programs and participate in international experiences.
- Enhance your skills in 3D digitization, AI, and digital creativity.
- Connect with a dynamic network of experts and institutions.

