

# Web-based integrated solutions for Cultural Heritage

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CNR ISPC



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delle Ricerche

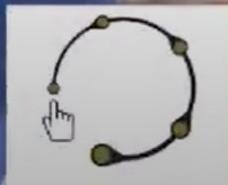


I COND  
VISIONI  
Conferenza GARR 2022  
Palermo 18–20 maggio



web-based design  
web-based data generation (webgis...)  
web-based data management  
web-based data editing  
web-based data analysis  
web-based storytelling and narrative content creation [twine et al]  
web-based exploration (visualisation et al)  
web-based evaluation

Users evaluation



00 : 22

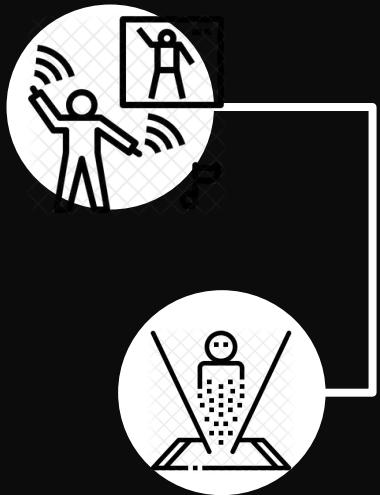
II ▶ ◀ 0:01 / 0:04 8 years ago... Keys to Rome: a collaborative production



**80.000 visitors  
4 museums  
4 collections  
7 applications  
10 countries  
involved in a  
web-based  
production**

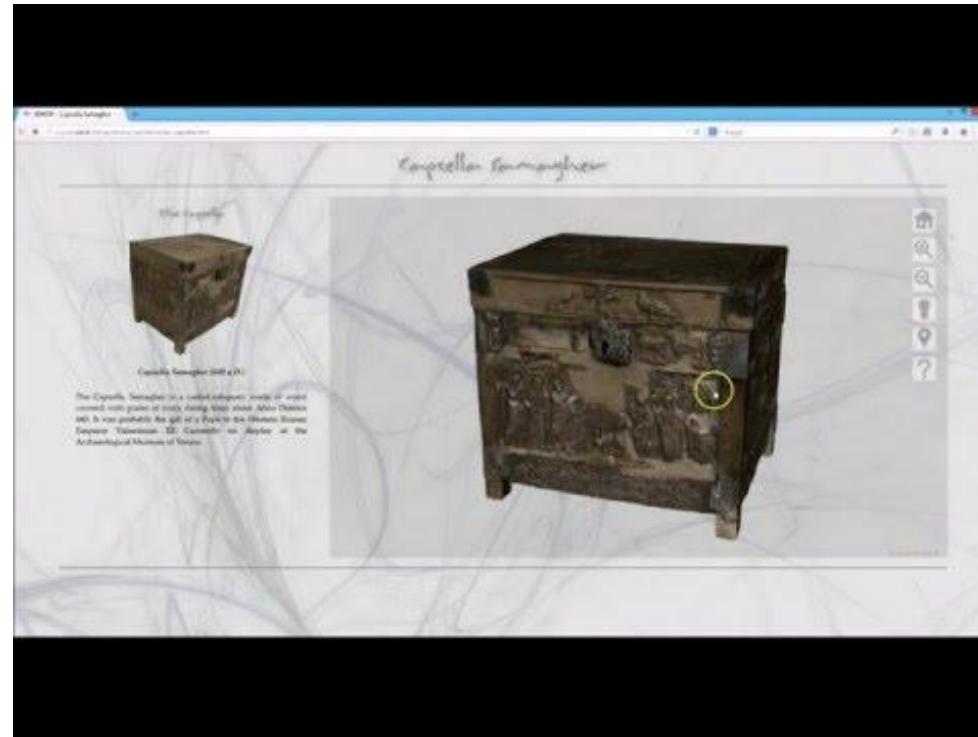
# Admotum

## *holoint*



# 3DHOP (3d heritage online presenter)

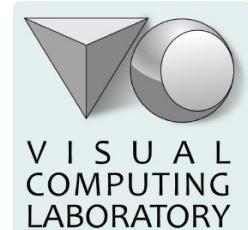
piattaforma per integrare all'interno di pagine internet modelli 3D ad alta risoluzione, quali ad esempio quelli ottenuti per scansione 3D. Gestisce la complessità dei dati in ingresso mediante un motore di rappresentazione e rendering multirisoluzione.



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# Visual Media Service

<http://visual.riadne-infrastructure.eu/>



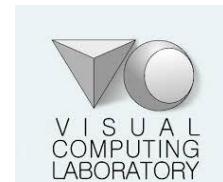
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DELL'INFORMAZIONE "A. FAEDO"

Il Visual Media Service consente una semplice pubblicazione e presentazione online di asset digitali complessi.

The screenshot shows the ARIADNE visual media service interface. At the top, there's a navigation bar with links for 'ARIADNE visual media service', 'Browse', 'Upload', 'Help', and 'Contacts'. To the right is the 'ARIADNE' logo. Below the navigation, the main heading 'ARIADNE visual media service' is displayed, followed by the subtext 'Create your online showcase for 3d models, images and RTI.' There are two buttons: 'Upload »' and 'Browse »'. The page is divided into three main sections:

- 3D models**: Describes 3D representations produced with 3D scanners or photogrammetry. It includes a 'View details »' button and a 'Demo' button.
- RTI images**: Describes Relightable images (Reflection Transformation Images, RTI, or Polynomial Texture Maps, PTM). It includes a 'View details »' button and a 'Demo' button.
- High-resolution images**: Describes high-resolution images as a commodity resource in archaeology. It includes a 'View details »' button and a 'Demo' button.

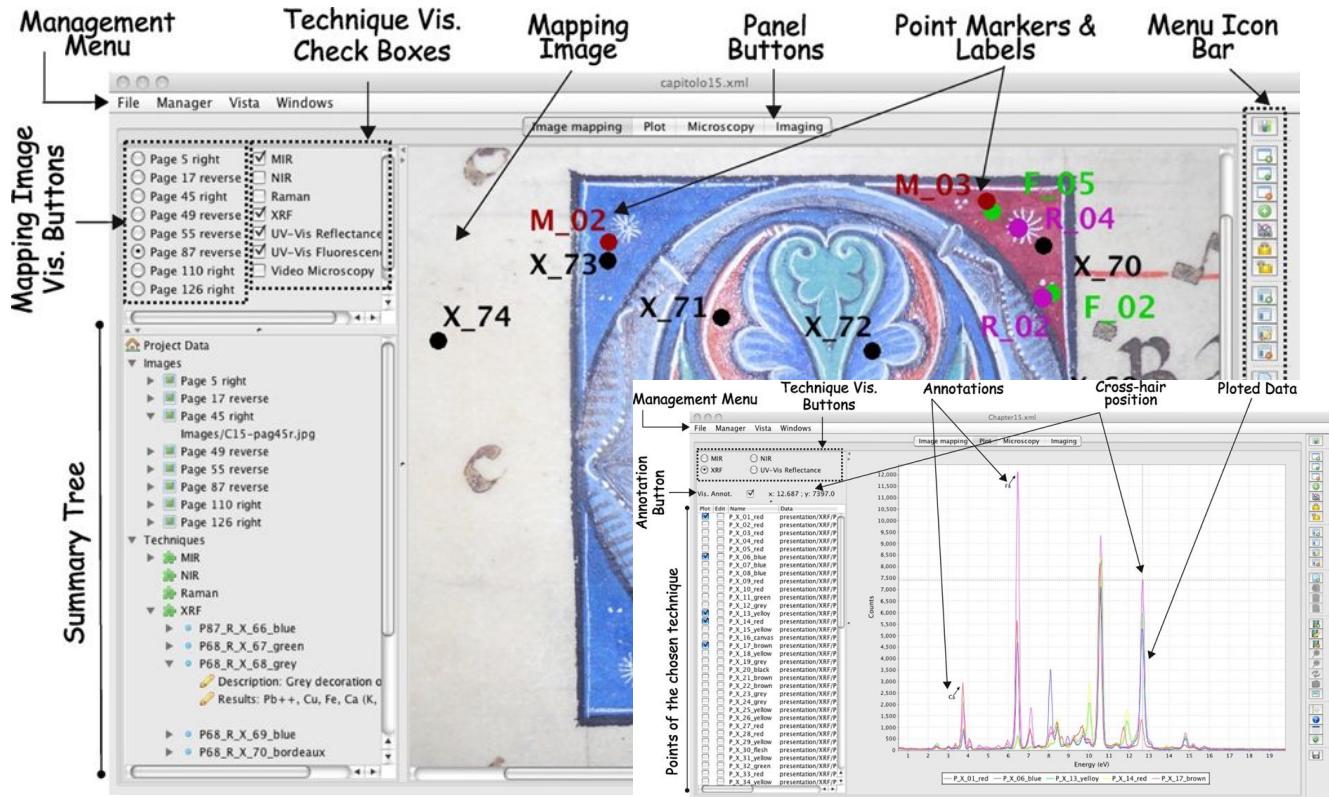
At the bottom of the main content area, it says 'Visual Computing Lab - ISTI - CNR'.



# Movida

<https://www.sciencedirect.com/science/article/pii/S1296207412000477>

MOVIDA (MOBILE- laboratory VIsualization Data): software per data management e analisi di indagini non invasive per il patrimonio culturale. Consente “digital preservation” delle informazioni e funzioni analitiche attivabili già durante le misure in situ. Utilizzato dal MOLAB di E-RIHS





# la pandemia

Nuove priorità, Nuove necessità, Nuovi requisiti

# virtual tourism

A photograph of a woman with long blonde hair, seen from behind, wearing a VR headset. She is standing in a vast, green, mountainous landscape, likely a fjord or deep valley, with steep mountains rising on either side. The sky is overcast. The text 'virtual tourism' is overlaid in large white letters across the center of the image.

I visitatori cercano esperienze Significative, autentiche e Memorabili

# Meraviglia e Empatia (storica)(EMOTIVE)

Social VR for heritage: designing care and affect  
into multi-user virtual reality

The ÇVR Experience - Overview

# Meaningfulness

A photograph showing a close-up of a person's hand holding a vintage-style compass. The compass is oriented vertically, with the needle pointing towards the top. The background features a rustic stone wall on the left and a large, craggy rock formation on the right, set against a bright blue sky with some greenery.

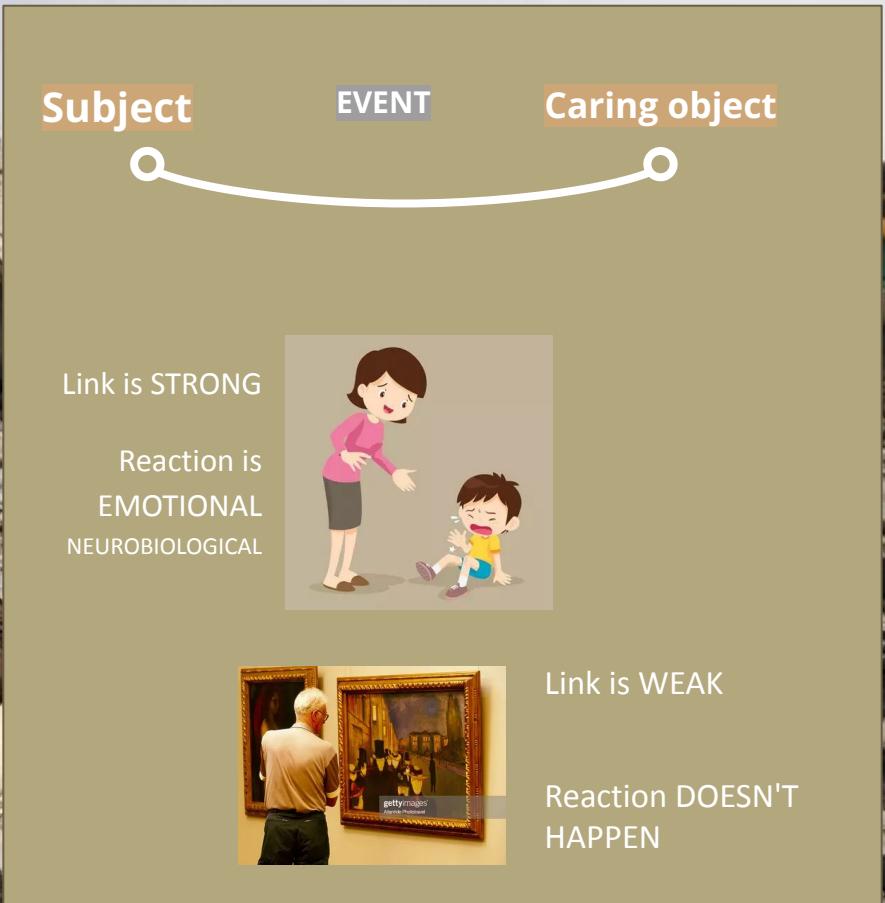
Historical Enchantment

Facilitated Dialogue

Provocation



**cura per il nostro patrimonio**



# Senso di appartenenza (Social Cohesion)

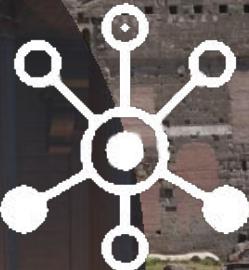


# Auth



Autentico è quello che tocca il profondo di una persona,  
che dura nel tempo, che si sviluppa e cambia insieme alla persona

K. Jaspers, Psychologie der weltanschauungen, 1919



# Strumenti

# ATON framework



<http://osiris.itabc.cnr.it/aton/>

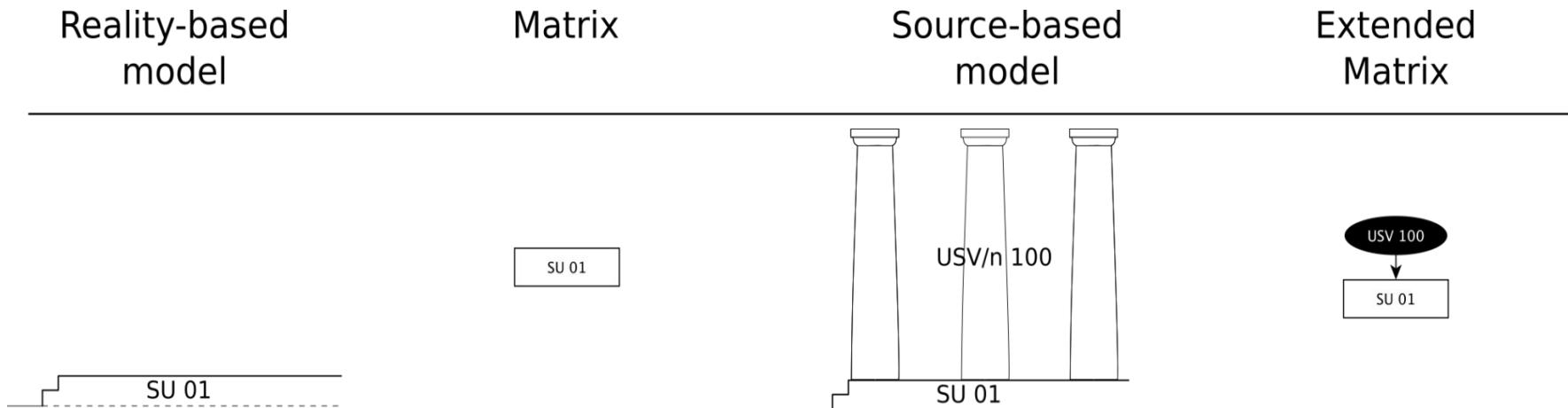
- **Open-source**
- Permette di creare web-app **cross-device** (*mobile, desktop, kiosk, HMD*)
- **Modulare**
- **Multi-utente**
- Progettato attorno a **standard web moderni**

B. Fanini, D. Ferdani, E. Demetrescu, S. Berto, E. d'Annibale (2021). **ATON: An Open-Source Framework for Creating Immersive, Collaborative and Liquid Web-Apps for Cultural Heritage**. Applied Sciences, 11(22), 11062.

# EM e EMviq

<http://osiris.itabc.cnr.it/extendedmatrix/>

EM è un linguaggio formale con cui tenere traccia durante il lavoro di interpretazione necessario ad una ricostruzione virtuale.



EM 1.2 (beta) - June 2020

# Extended Matrix Quick Start

E. Demetrescu

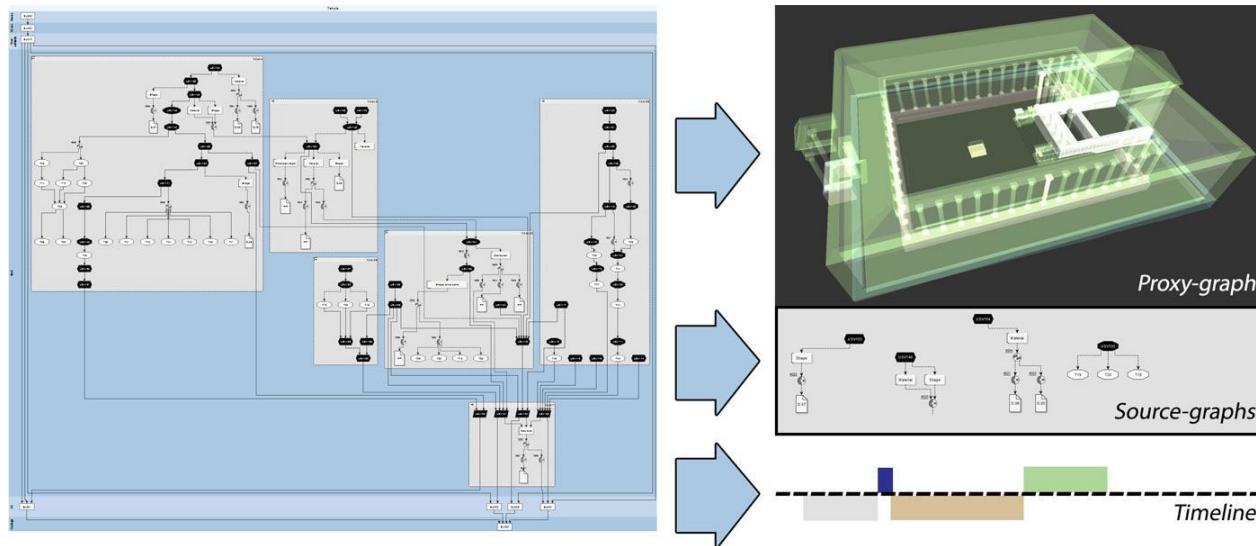


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# EM e EMviq

<http://osiris.itabc.cnr.it/scenebaker/index.php/projects/emviq/>

EMviq (Extended Matrix Visual Inspector and Querier) è uno strumento interattivo di visualizzazione 4D e di interrogazione runtime, che consente un'estrazione automatica di files GraphML (EMs) collegati ad una visualizzazione 3d. EMviq è sviluppato da B. Fanini (CNR ISPC)



<https://aton.ispc.cnr.it/a/emviq/?s=samples/montebelluna>

# EMviq



# e-Archeo

Progetto Valorizzazione Parchi Archeologici ALES-MIC  
(piattaforma web runtime - 8 parchi archeologici - CNR ISPC direzione produzione esecutiva) - fruizione diffusa: on line (home), mobile (on site), cardboard e oculus - scenari multi-tematici e temporali (layer attuale, ricostruttivo, data transparency)



Ministero  
dei beni e delle  
attività culturali  
e del turismo

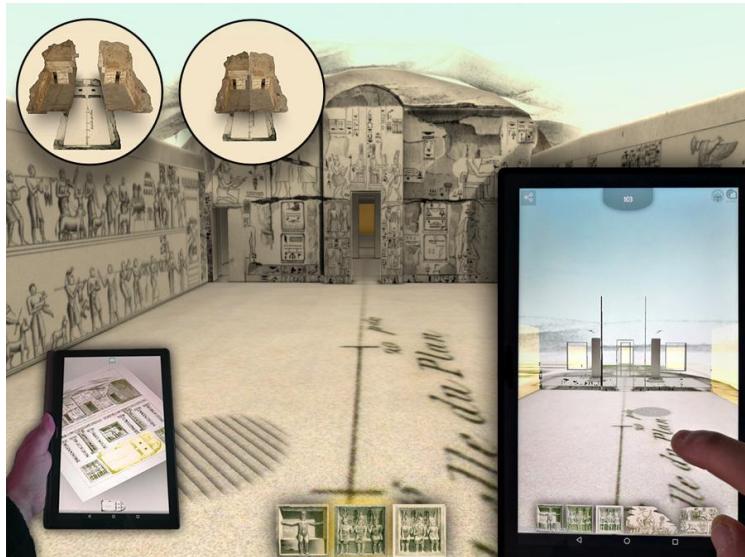


# REDRASK (3D puzzle based on ATON)



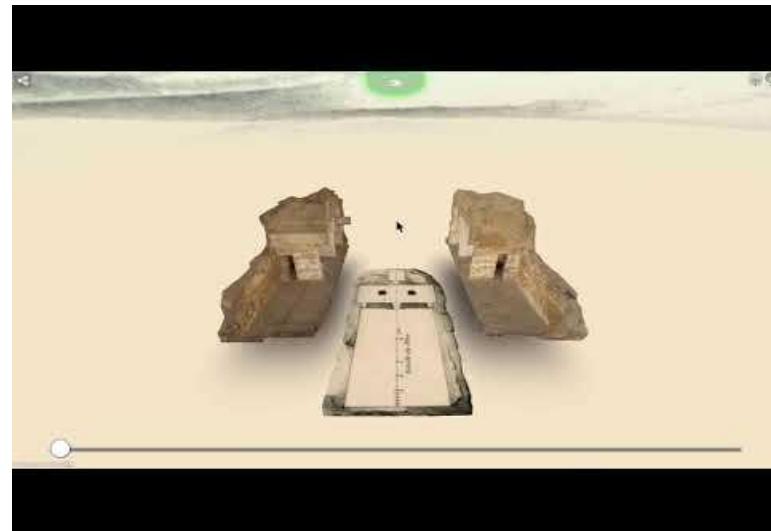
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spc ISTITUTO DI  
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PATRIMONIO CULTURALE



<http://www.backtothefuture.polito.it/TemplePuzzle3D.html>

- Online 3D puzzle (cross-device)
- Ricontestualizzazione (elementi da tavole del 1800)



M. Lo Turco, P. Piumatti, M. Calvano, E. C. Giovannini, N. Mafrici, A. Tomalini, B. Fanini (2020). Interactive Digital Environments for Cultural Heritage and Museums. Building a digital ecosystem to display hidden collections. DISEGNARECON - ISSN 1828 5961

# Temporal Lensing (ATON)



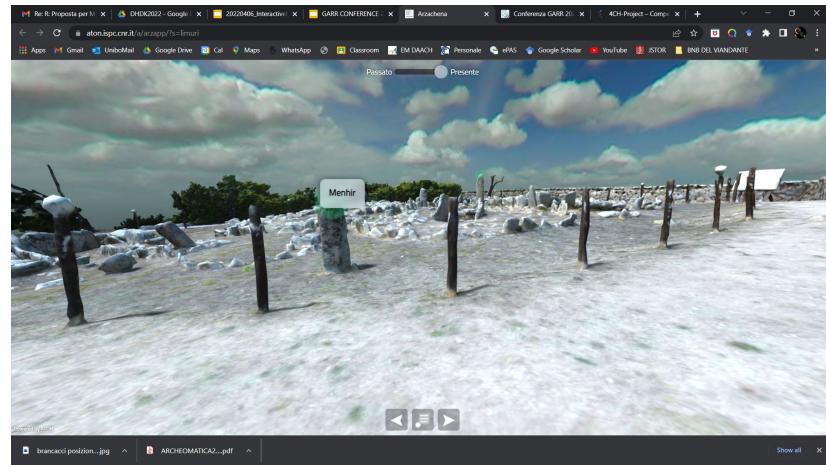
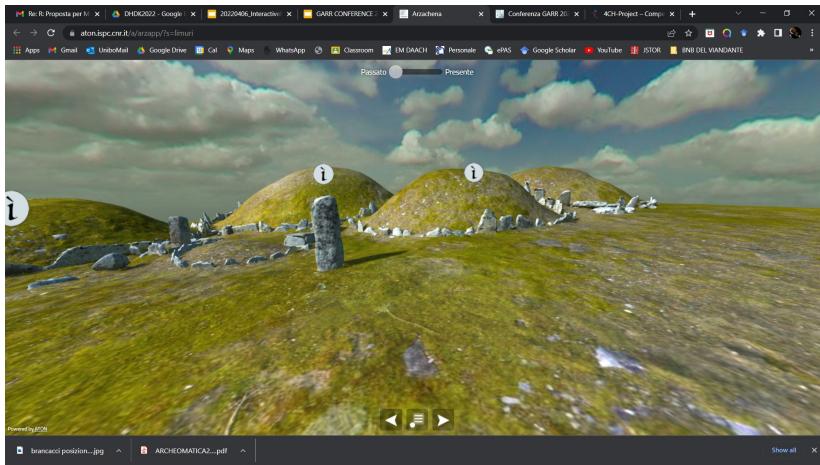
Mobile / Desktop / Immersive VR

B. Fanini, D. Ferdani, E. Demetrescu (2021) Temporal Lensing: An Interactive and Scalable Technique for Web3D/WebXR Applications in Cultural Heritage. *Heritage*. 2021; 4(2): 710-724

# Civiltà Nuragica



<https://www.arzachenaciviltamillenaria.it/guida-interattiva>  
<https://aton.ispc.cnr.it/a/arzapp/?s=limuri>



# Brancacci VR



# IL CANTIERE della CAPPELLA *Brancacci*



# The turning point infrastrutture per le Heritage Sciences

E-RIHS: European Research Infrastructure for Heritage Science



# Integrated platforms of the E-RIHS



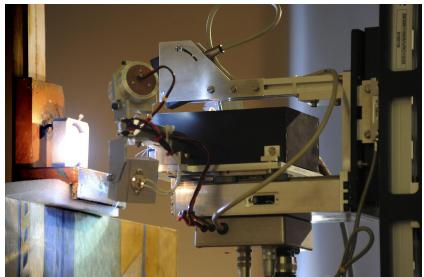
## Archlab:

Access to specialised knowledge and organized scientific information in datasets largely unpublished from archives of prestigious museums, galleries and research institutions.



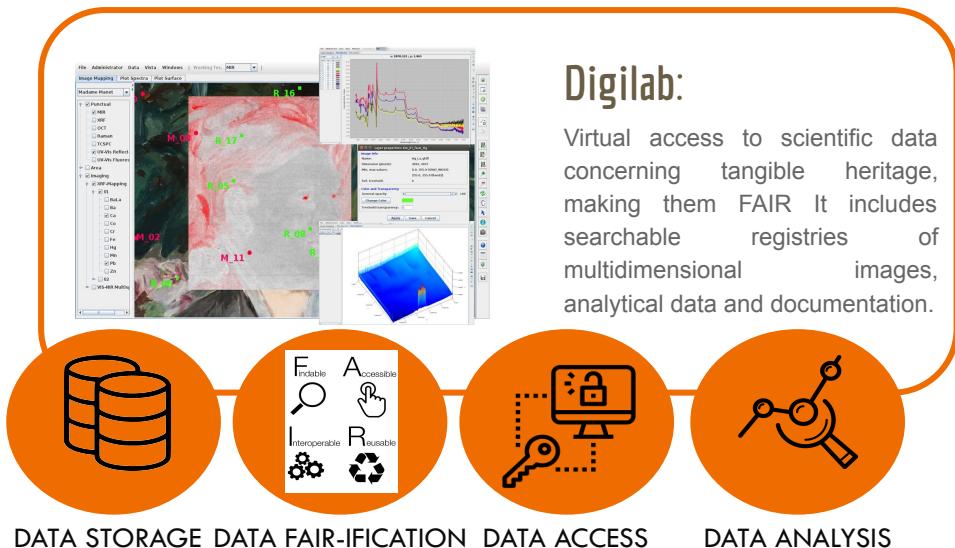
## Fixlab:

Access to large-scale and medium-scale facilities particle accelerators and synchrotrons, neutron sources; non-transportable analytical instruments.



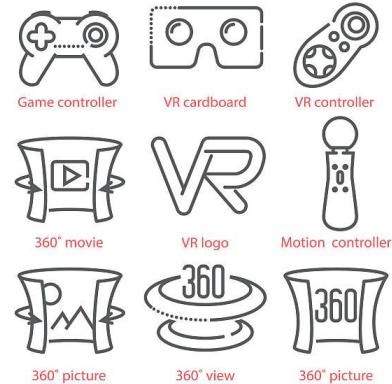
## Molab:

Access to an impressive array of advanced mobile analytical instrumentation for non invasive measurements on valuable or immovable objects, archaeological sites and historical monuments.



# DIGILAB nel PON SHINE

Strategia Nazionale di Specializzazione Intelligente



## Area tematica

Turismo,  
Patrimonio  
culturale e  
industria della  
creatività

## Traiettoria di sviluppo

Tecnologie e applicazioni per la conservazione, gestione e  
valorizzazione dei beni culturali, artistici e paesaggistici.

# SHINE azione potenziamento IR E-RIHS

## OR1 FIXLAB

- Stonelab
- Dating lab
- Insideout-lab
- THz-lab
- X-Ray tomo-lab

## OR2 reMOLAB

- Ground-lab
- Aerial-lab
- Marine-lab

## OR3 hyMOLAB

- Xray-lab
- Molecular-lab
- Optical-lab

## OR4 DIGILAB

- VRDesignCenter-LE
- BackupCenter-LE
- DataCenter-NA
- Cavea-NA
- FabLab-NA

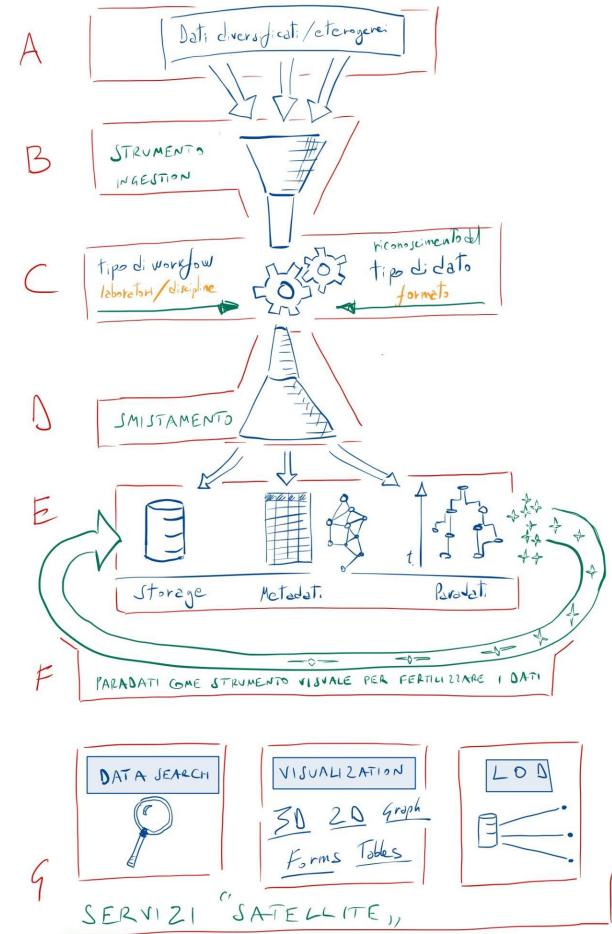
# DIGILAB WORKING GROUP

## CH Data Space CNR ISPC

<https://www.archesproject.org/>

Exploratory phase:

# arches



# European trend topics

DG CONNECT trend topic:

digitalizzare TUTTO il patrimonio culturale a  
rischio entro il 2030, il 40% entro il 2025

(con call specifiche finalizzate a creare un data  
space per il patrimonio culturale)

[fonte: Europeana conference 2022]

DG RESEARCH AND INNOVATION :

european collaborative cloud for cultural heritage

Digital Library del Patrimonio

Cloud nazionale della ricerca



# Digital Library del Patrimonio Culturale

Digitalizzazione delle collezioni di musei,  
archivi e luoghi della cultura, per  
aumentare le risorse culturali digitali.

65 milioni di risorse digitali da rendere  
disponibili nella Digital Library in 3 anni.



# Verso un nuovo Rinascimento

Cognitively and emotionally enriched multi-user web-based VR environments and platforms

Science integrated platforms

[sofia.pescarin@cnr.it](mailto:sofia.pescarin@cnr.it)