



Arts and Culture using Virtual worlds

NEM SUMMIT 2025

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Creation and reuse of 3D digital cultural heritage assets: *between technical advancements and capacity building*



XR
culture

XR culture

eXplore & Reuse 3D cultural heritage within the Data Space

<https://xrculture.eu/>

Follow us: #XRCulture



3D-4CH

Online Competence Centre in 3D for Cultural Heritage

<https://www.3d4ch-competencecentre.eu/>

Follow us: #3D4CH



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the European Union

COMMON EUROPEAN
DATA SPACE FOR
CULTURAL HERITAGE

COMMON EUROPEAN DATA SPACE FOR CULTURAL HERITAGE

ADAPT. ASPIRE. ACHIEVE

MERMAID (DANISH: HAVFRUE) IS
A BRONZE SCULPTURE DESIGNED
BY THE DANISH SCULPTOR ANNE
MARIE CARL-NIELSEN,
DEPICTING A MERMAID.

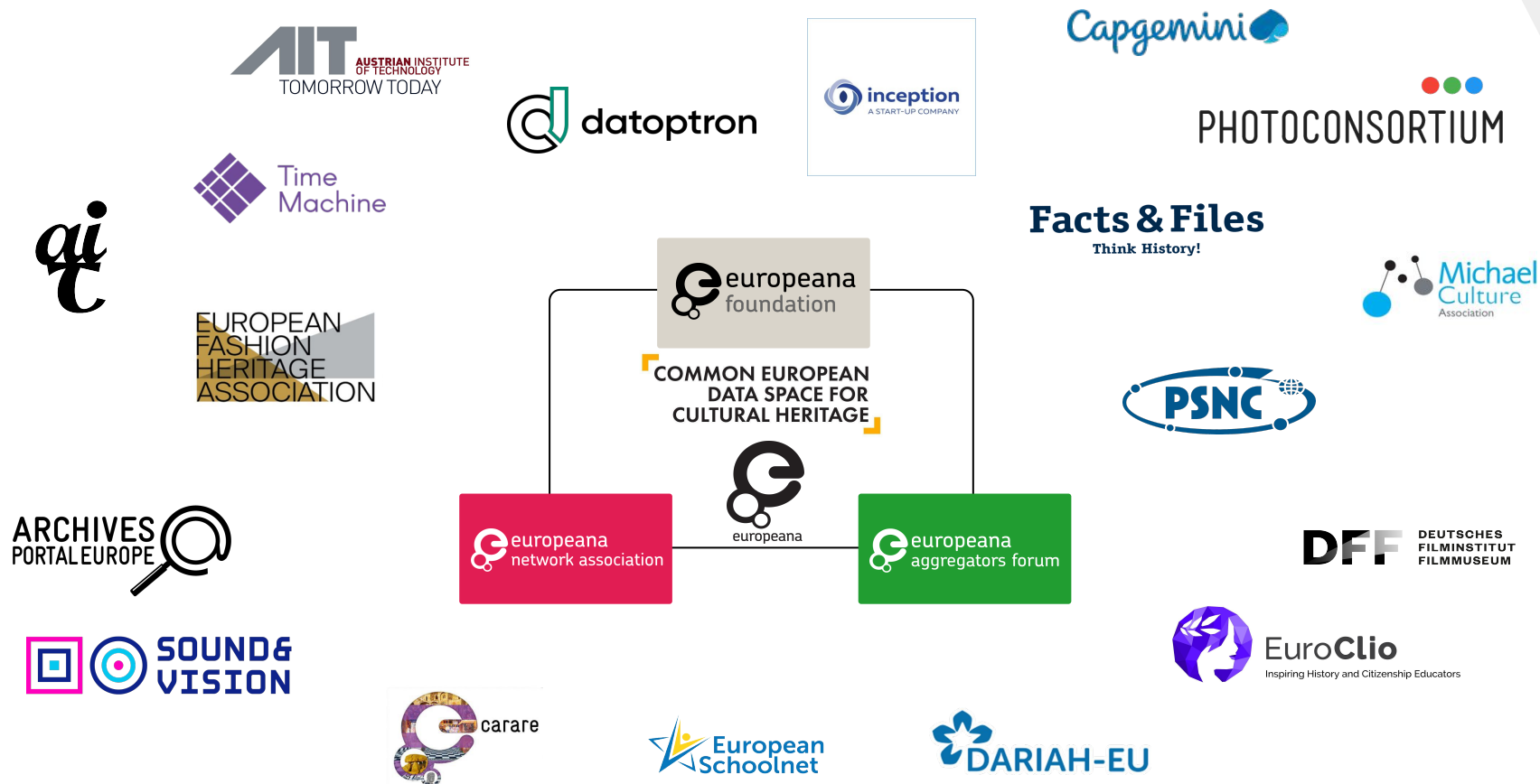
PLACE: SMK - STATENS
MUSEUM FOR KUNST

LICENSE: CC0

1921



The consortium



A grayscale photograph of two women sitting at a desk, looking at a laptop. The woman on the left is smiling and looking at the screen, while the woman on the right is pointing at the screen. The background is slightly blurred, showing shelves and other people in the distance. The text is overlaid in the center, flanked by two large yellow arrows pointing towards each other.

*We democratise
access to cultural
heritage data*



Define quality
requirements for 3D
for the Europeana
Publishing
Framework



Contribute to the
building of a training
programme for 3D



Develop an extension of
the Europeana Data
Model for 3D



Advise in data
governance discussions
around 3D

3D Working Group



Mainstream 3D in
products & services



Position the
data space

XR culture

eXplore & Reuse 3D cultural heritage within the Data Space



⇒ Project data:

XRCulture – eXplore & Reuse 3D cultural heritage within the Data Space

Number: 101174317 – **Duration:** 18 months

Start Date: 01 Feb 2025 – **End Date:** 31 July 2026

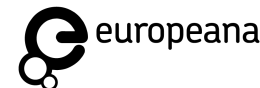
⇒ Key areas:

Employing
AI-based
techniques for
high-quality 3D
model creation and
improvement

Enabling XR
applications for
education, tourism,
and preservation

Developing an open
framework for 3D
visualization

⇒ Consortium



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Focus Area 1: AI-based techniques for high-quality 3D

⇒ New digitizations:

- Traditional **photogrammetry** meets **AI-powered NeRFs**
- **Gaussian Splatting** for challenging surfaces (glass, jewels, reflective)
- Creating **high-quality 3D models** beyond current limits

⇒ Improving existing 3D models:

- **Super-resolution AI** to sharpen details & enhance textures
- **AI-based** material recognition and **synthetic texture generation**
- Automated procedure to **optimise 3D models** for XR

Ongoing new digitizations

301 →  Italian Ministry of Culture (IT)
 62 →  Bleschunov Museum (UA)
 273 →  Archaeological Museum of Istria (HR)
 6 →  UNIVPM (Syria)

642 models identified so far

✨ *Totals are continuously updated as work advances*

Ongoing model improvements

164 →  Italian Ministry of Culture (IT)
 57 →  Bleschunov Museum & buildings
 20 →  UNIVPM archives

241 models identified so far



Gulyaka (Turkmen - gūlyaka) 1930-40s. O.Bleschunov collection, 1989.
<https://poly.com/capture/9a98d185-026e-424a-a8b6-ecfc34cd0139>



Glass beaker (Isings 31 type), 1st-2nd century CE, National Archaeological Museum of Adria
<https://poly.com/capture/9a98d185-026e-424a-a8b6-ecfc34cd0139>



Focus Area 2: enabling XR applications

⇒ XR for Heritage at Risk

- A **mobile AR application** to support the **protection of cultural heritage** in areas threatened by **conflict or environmental hazards**.
- Enables **guided 3D data capture**, **AI-based material recognition**, and **procedures for conservation and evacuation**.

⇒ XR for Heritage Tourism

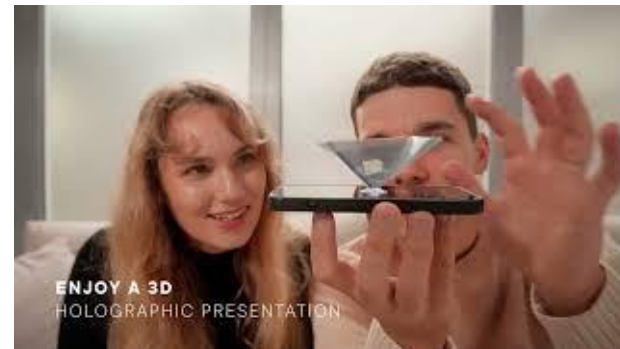
- Simplified access to **AR holograms** as a **low-cost solution** for **DMOs (Destination Management Organisations)**.
- More than **40 tourism destinations** responded to our **open call (June–July)**, offering **3D models** for the creation of **Holographic Postcards**.

⇒ XR for Dispersed Heritage

- A **mixed reality experience** to **virtually reunite** movable and immovable cultural heritage.
- Helps **contextualise archaeological finds and collections** that **excavations and museum practices** have separated.

⇒ XR for Education

- **Immersive VR learning** tested against **traditional methods** to demonstrate the **value of 3D in education**.
- Uses **3D models of architectural Lost Heritage** to bring **disappeared treasures** closer to **young audiences**.



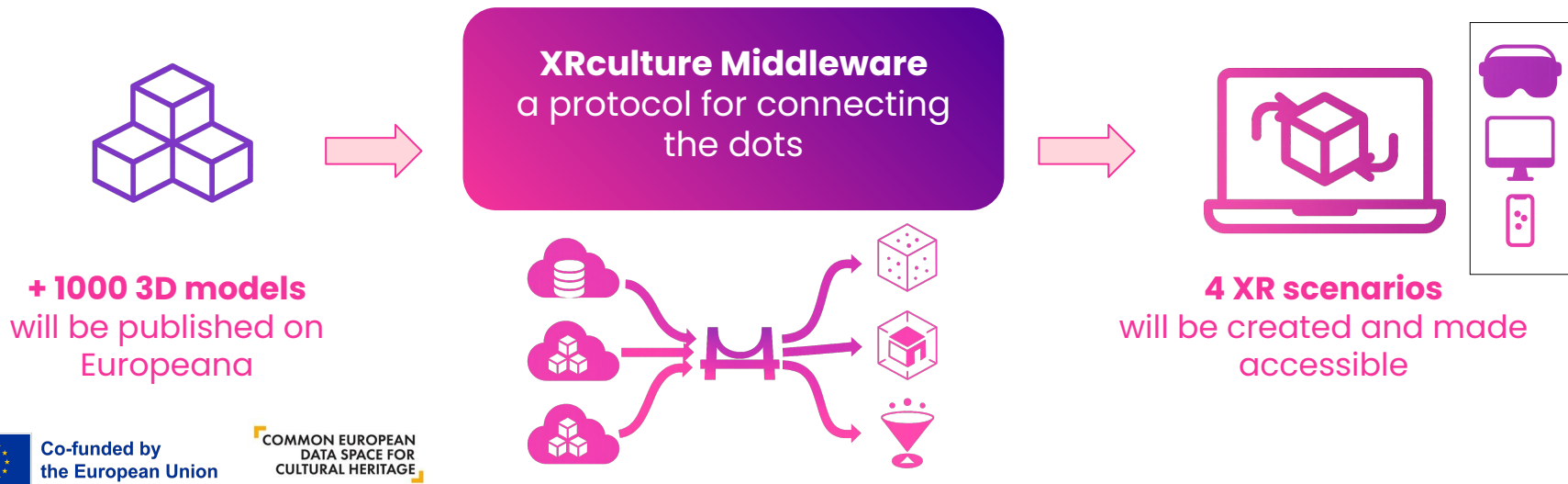
Focus Area 3: open framework for 3D visualization

⇒ What it does

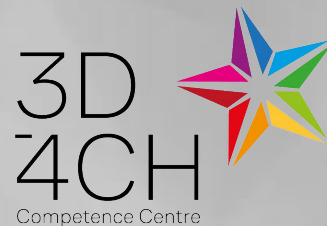
- Provides **standardisation & interoperability** for 3D Cultural Heritage
- Acts as an **intermediary layer** between storage, converters, viewers, and user apps
- Supports **3D MIME types** and **oEmbed embedding**

⇒ Why it matters for institutions

- Retain **full ownership and control** of 3D data
- Gain **flexibility** to select, customise, or switch 3D viewers
- Benefit from **enhanced security, transparency, and compliance**
- Enable **interoperability across diverse applications and databases**



3D-4CH – Online Competence Centre in 3D for Cultural Heritage



Acronym: 3D-4CH - Number: 101195149

Project website: <https://www.3d4ch-competencecentre.eu/>

Duration: **36 months** - start date: 1 February 2025

Topic: DIGITAL-2024-CLOUD-DATA-AI-06-COMPETENCE

Call: DIGITAL-2024-CLOUD-DATA-AI-06

Type of Action: DIGITAL-DATA

Keywords: Cultural heritage, 3D digitisation, 3D technologies,
3D tools, 3D contents, Artificial Intelligence, XR, VR



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About

The 3D-4CH project will establish an online Competence Centre for 3D cultural heritage, focusing on preservation, digitisation, and knowledge transfer in the EU and Ukraine. Building on projects like 4CH, DS4CH, and 5DCulture, it will leverage networks from 4CH, E-RIHS, and DARIAH

Special focus will be on Ukraine, expanding the "SUM – Save Ukraine Monuments" initiative.

Key Objectives comprise: Capacity Building, Comprehensive Services, High-Quality 3D Content, R&D in 3D Technologies.

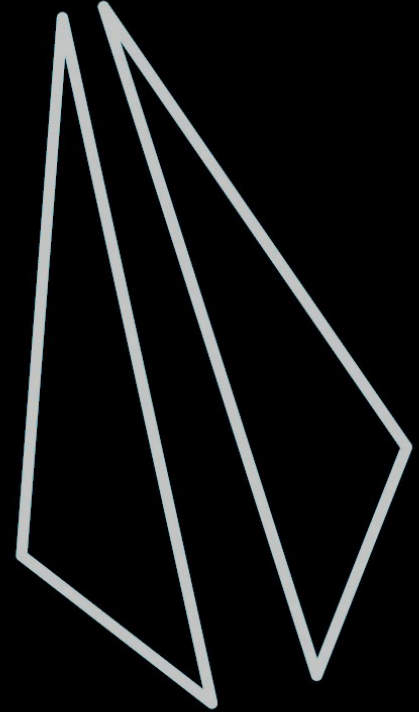
Key Pillars

Training &
Capacity
Building



3D deployment
based on latest
and most
advanced
technologies

An online platform
for training and
capacity building
exploiting cutting
edge services and
tools



What will the Online Competence Center offer?



Provide Learning Resources



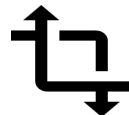
Facilitate Collaboration



Promote Sustainability



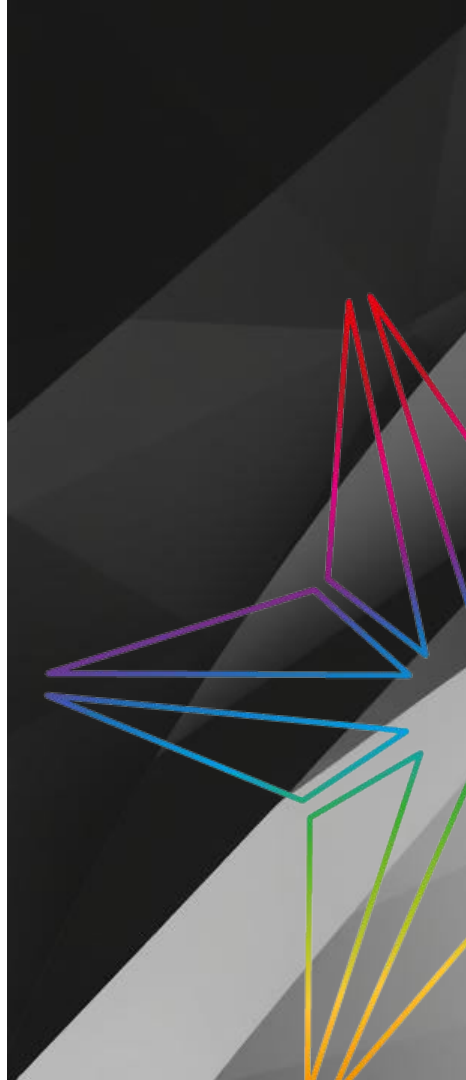
Centralized Knowledge Base



Support Digital Transformation



Specialized Support



Project Partners

1. INCEPTION (coordinator) (IT)
2. Università degli Studi di Ferrara (IT)
3. EUROPEANA Foundation (NL)
 - Europeana Network Association (NL) (*affiliated*)
4. Fondazione Bruno Kessler (IT)
5. Connecting Archaeology and Architecture in Europe – CARARE (IR)
 - NGO Volyn Foundation (UA) (*affiliated*)
6. Time Machine Organization (AT)
7. IN2 Digital Innovations GmbH – IN2 (DE)
8. The Discovery Programme Centre for Archaeology and Innovation Ireland – DISC (IR)
9. ARCTUR (SI)
10. RDF Ltd. (BG)
11. Pixelated Realities (UA)
12. Consiglio Nazionale delle Ricerche – CNR-ISPC (IT)
13. The Cyprus Institute (CY)
14. Pozan Supercomputing and Networking Center – PSNC (PL)

15. University of Calabria / 3Dresearch (IT)
16. European Fashion Association (IT)
17. Talent Anonymos Etaira Pliroforikis – TALENT (GR)
18. Netherlands Institute for Sound and Vision (NL)
19. Michael Culture Association (BE)
20. Athena Research Center (GR)
21. Royal Museums of Art and History (BE)
22. University of Jean (ES)

Associated Partners

22. Istituto Nazionale di Fisica Nucleare (IT)
23. Fondazione PIN – Polo Universitario Città di Prato (IT)
24. Highbury Research & Development Ltd. (Ie)
25. Dipartimento della Protezione Civile (IT)
26. Centre National de la Recherche Scientifique – CNRS-MAP (FR)

April-May 2025: we launched our surveys

- We carried out two surveys that informed (and are still informing) our activities:
 - Survey on Training Courses, Materials, and Curriculum;
 - Survey on Target Groups of the 3D Online Competence Centre.



Results and insights from the surveys

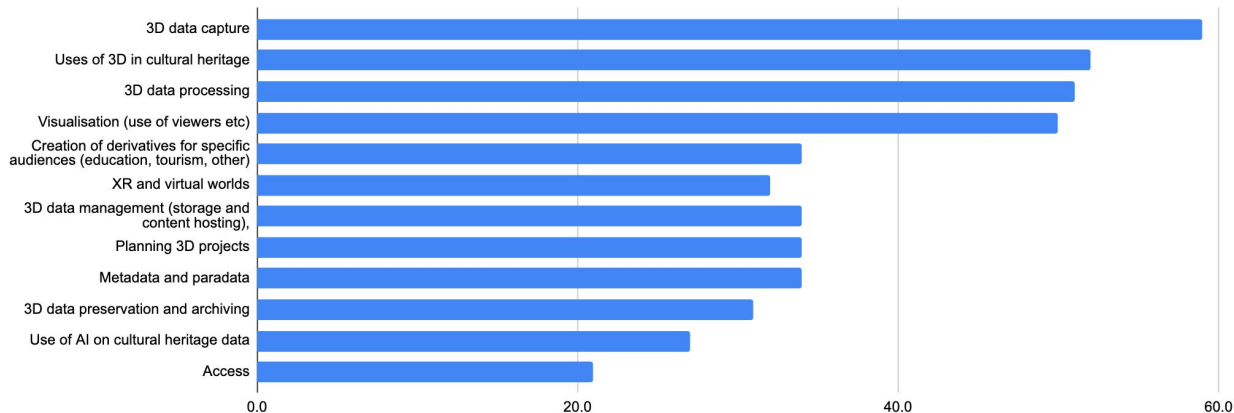
Training topics

The topics most respondents reported covering in training were **3D data capture** (88%), **Uses of 3D in cultural heritage** (78%), **3D data processing** (76%) and **Visualisation** (75%).

Less frequently reported were **Access and licences** (31%), **Uses of AI on cultural heritage data** (40%) and **3D data preservation and archiving** (46%).

The other 5 topics (metadata and paradata, 3D data management, Creation of derivatives, XR and virtual worlds and planning 3D projects) were reported by 32-45% of respondents.

Responses by training topic



Type of heritage

58 respondents reported on the type of heritage covered in their training, the results show:

- immovable heritage (94.8%)
- moveable heritage (87.9%)
- intangible heritage (31%)
- other (1.7%)

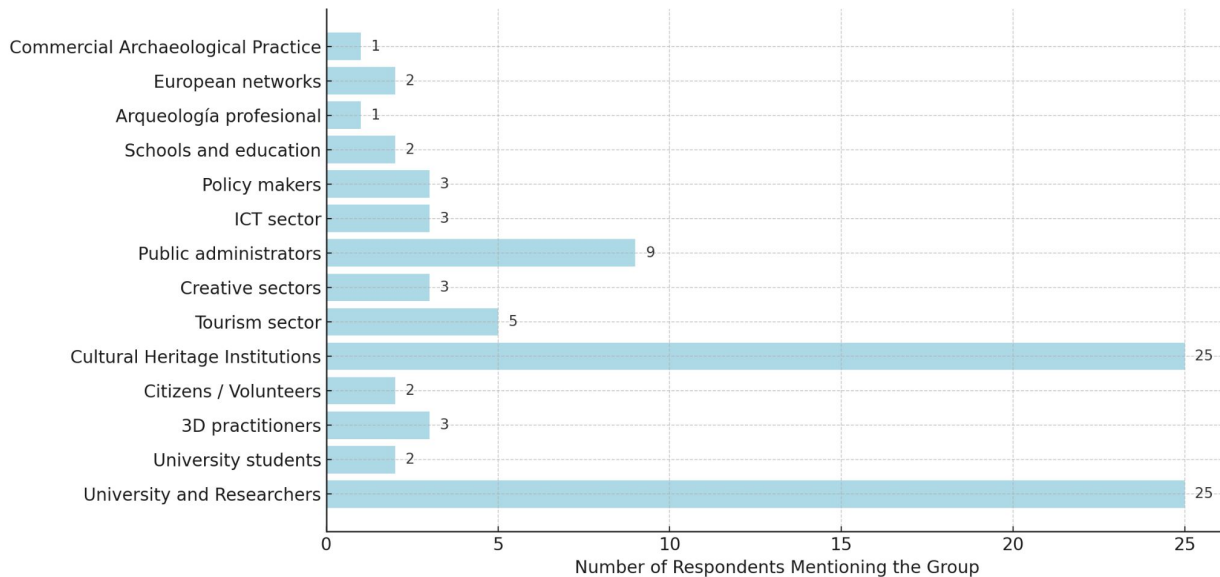
Some surprises

- 84.5% of respondents reported covering both immovable and moveable heritage in their training
- Only 7% reported specialising in either immovable or moveable heritage

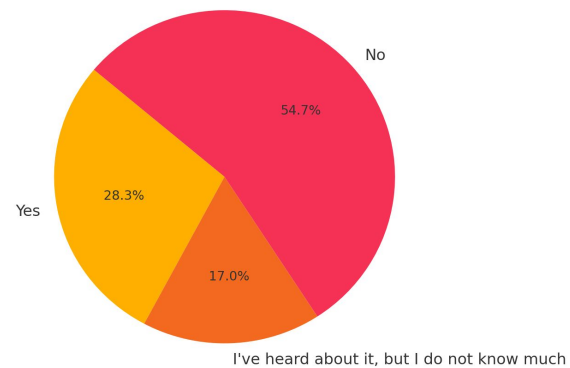


Travel theodolite, Billwiler Kradolfer,
ETH Library, CC BY SA

Who did we reach so far

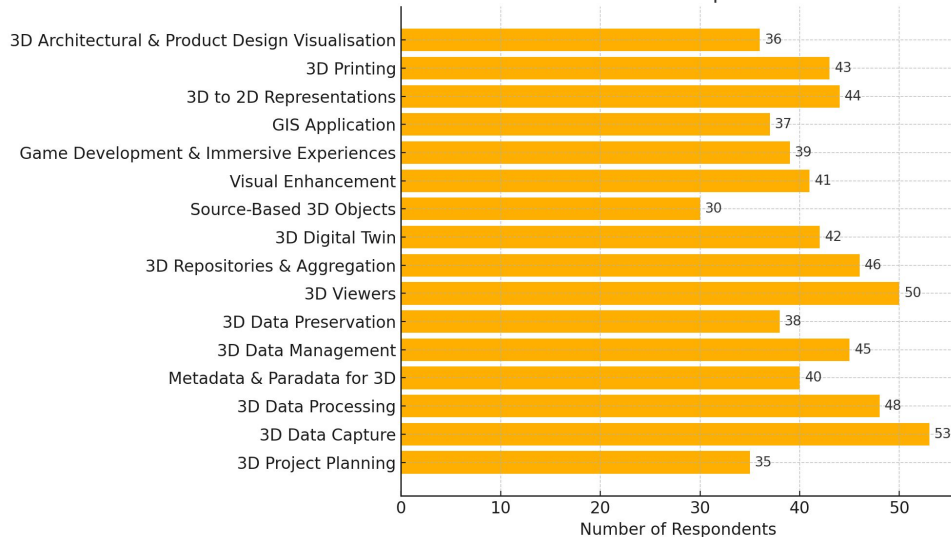


Awareness of 3D-4CH Online Competence Centre

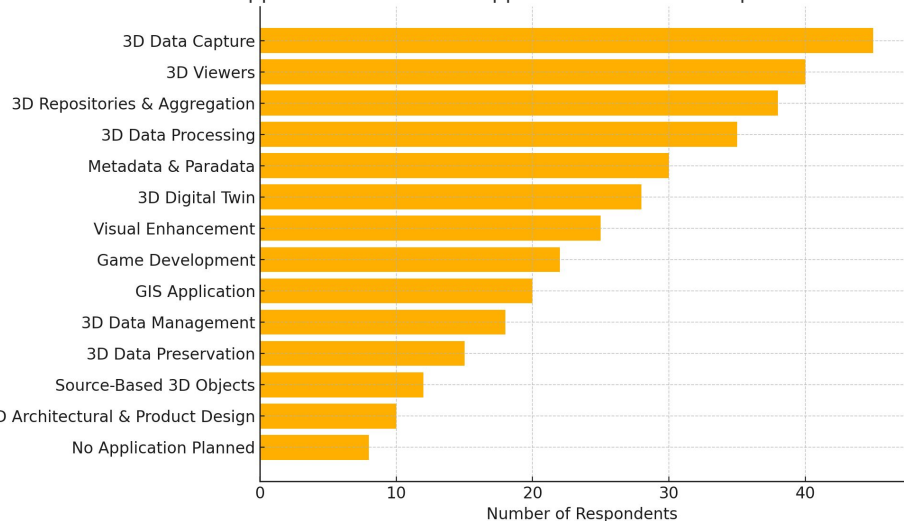


Awareness and Knowledge of 3D

Awareness of 3D Techniques and Practices



Application or Planned Application of 3D Techniques and Practices



Mazzacca, G., Sterpin, A., Rigon, S., Medici, M., & Remondino, F. (2025). *A Roman carved tale modelled in 3D and interpreted with AI*. In Proceedings of the CIPA 2025 Symposium: Heritage Conservation from Bits – From Digital Documentation to Data-driven Heritage Conservation. Seoul, South Korea: CIPA. [Best Paper Award]



Save the Date | 21-23 Jan. 2026 3D-4CH Winter School in Brussels

Secure your ticket:

<https://www.3d4ch-competencecentre.eu/trainings/3d-4ch-winter-school>



Save the Date | 21-23 Jan. 2026

3D-4CH Winter School in Brussels

Day 1 – Wednesday, 21 January - *Hybrid session (full day, streamed via YouTube)*

Morning (9:30-12:30 CET)

- Opening and institutional welcome
- Setting the scene: Inspiring speeches

Afternoon (14:00-17:00 CET)

- Focus on 3D projects planning (How to introduce digital/3D in your institutions with best practices and lessons learnt)

Day 2 & 3 – Thursday & Friday, 22-23 January 2026 - *Workshop (full day, in-person only)*

Full day (9:30-17:00 CET)

Overview of the complete digitisation workflow

Hands-on experience with tools and methods

Reflections and Next Steps

Secure your ticket:

<https://www.3d4ch-competencecentre.eu/trainings/3d-4ch-winter-school>

Thank you for your attention!



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<https://xrculture.eu/>

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