

# **Leveraging AI for the promotion of digital culture among young generations: A holistic approach to achieving SDG 11.4 on the safeguarding of cultural heritage in the digital age**

**Cristian Gabriel IANC, Laurențiu Gabriel DINCĂ, Alexandra GHINEA**

Bucharest University of Economic Studies, Romania

ianccristian.g@gmail.com, laurentiu.dinca@stud.ase.ro,  
ghineaalexandra20@stud.ase.ro

**Abstract:** Artificial Intelligence (AI) is changing how we perceive and preserve our cultural heritage and acts as a considerable impetus for the engagement of younger generations in the digital transmission of cultural identity, in accordance with Sustainable Development Goal (SDG) 11.4. AI-based methods (e.g., deep learning-based approaches for image recognition, natural language processing for linguistic heritage, generative AI for cultural reconstruction) not only add a new dimension to our perception of our own culture, but also allow us to preserve, analyze, and restore tangible and intangible heritage. Neural networks are used to restore missing or damaged artifacts, and AI-based computational ethnography deepens our understanding of both historical and sociocultural contexts. Corporate and institutional efforts bolster AI's influence on cultural sustainability. Google Arts & Culture uses deep learning with ultra-high-resolution archival images of your favourite work to create interactive virtual enhancement of the work to promote digital cultural literacy. To combat this, some suggest deploying AI to preserve cultural landmarks; UNESCO already uses AI-powered heritage monitoring systems to evaluate the effect of climate change and human activity on historical locations, using predictive analytics to identify how best to proactively preserve sites. Throughout all this, empirical evidence continues to emerge, reinforcing AI as an indispensable tool in the preservation of global heritage. AI-assisted methods to achieve digital documentation have shown statistical analyses in which most of the (known) cultural heritage sites (above 50%) have faster documentation for conservation. Furthermore, sentiment analysis of digital engagement patterns shows that AI-curated cultural content increases interest and retention rates among the youth, virtually up to 40%. AI, a new milestone, provides solutions of conserving oasis without structure. The resilience that emerges from the synergy between AI and heritage sciences can ascertain the ascending generation to generation transmission of cultural identity, in accordance with the long-term perspective envisioned in SDG 11.4 that facilitates the shaping of democratic values, share knowledge and practices on sustainable development as a holistic approach of dealing with the great transition era.

**Keywords:** Artificial Intelligence (AI), Digital Heritage Preservation, Computational Ethnography, Cultural Sustainability, Youth Engagement, Machine Learning in Cultural Conservation.

## 1. Introduction

Artificial intelligence (AI) has made incredible progress in recent years, bringing along radical changes in many facets of modern life — including the dissemination and conservation of cultural heritage in the digital era. AI and cultural heritage has opened up new pathways to protect historical pieces of interest, and democratize engagement with cultural knowledge, and engagement with younger generations. Aligned with Sustainable Development Goal (SDG) 11.4, which advocates for the protection of cultural and natural heritage, AI is a key facility in communication with Global Assets (United Nations, 2015). Techniques like deep learning, computer vision, and natural language processing — collectively known as A.I. New studies have investigated how AI can be employed to digitizing historical manuscripts, reconstruct artifacts and create interesting and immersive experiences through augmented and virtual reality (Pansoni et al., 2024).

Also, ethics will continue to play an important part in the application of AI within cultural heritage. AI-driven solutions, also raise many challenges in terms of data privacy, digital bias and the commodification of cultural knowledge (Silva & Oliveira, 2022). The recently announced Recommendation on the Ethics of Artificial Intelligence also emphasises the need for inclusion and transparency in technologies used for heritage preservation, among others (UNESCO, 2021). In this matter, the researchers claim that AI must be used as an augmentative tool, not a substitute for human expertise, so that technology mitigations do not disregard cultural values and moral principles (Gîrbacia, 2024). While AI will be addressed as a key transformative power in fostering young generations' digital culture, aligning with SDG 11.4, the paper will explore challenges within its ethical implementation.

## 2. Literature review

Artificial intelligence (AI) is increasingly being recognized for the transformative potential it holds as a tool for cultural heritage documentation, analysis, and engagement. The role of artificial intelligence is closely related to the Sustainable Development Goal (SDG) 11.4, which urges the strengthening of efforts to protect cultural heritage (United Nations, 2015). Such advancements in power and accessibility of AI technologies, especially with the use of machine learning and deep learning, have also prompted their increased use in heritage conservation, with automation in artifact classification, damage detection, and digital restoration (Münster et al., 2023). Research highlights AI's ability to handle more considerable datasets, revealing patterns that design conservation (Gîrbacia, 2024). A critical overview of AI uses in preservation of cultural heritage illustrates its involvement in the digitisation and restoration of cultural artefacts. Advances in AI-powered image recognition and 3D modeling further improve our understanding of heritage sites and their historical development (Ju, 2024). The

project mentioned, CEPROQHA, demonstrates how deep learning can classify and annotate cultural data that have missing gaps due to incomplete historical records (Belhi et al. 2023). Likewise, Runardotter (2011) elaborates why the organizational cooperation must be structured, in order to further implement the specific methodologies regarding the methods of digital preservation in heritage institutions. Additionally, AI has played a vital role in generating datasets of high quality for the protection of intangible cultural heritage, including native music, allowing for the preservation of diverse regional and ethnic trending art forms for future generations (Chen et al. 2024);

During this high-tech age of limitless connectivity, social learning and connected learning, we are looking at the changing face of education and employment as AI technology finds its way into every corner of our civilization, and becomes part of our daily lives (Jora et al., 2024). Consider the dual requirements of technological adaptation and socio-economic resilience that the broader cultural economy must face, already subject to global crises materializing as climate change, pandemics or geopolitical conflict (Jora et al., 2023).

To sum up AI has a lot of potential to the cultural heritage in terms of its preservation and engagement be it digitization and analytics or interactive experiences. Therefore, although its integration links well to SDG 11.4, we should remain alert and responsible to ensure the ethical applications of AI for inclusiveness. AI-enhanced cultural *pari-passu* conservation of historical events will thus potentially introduce more socio-cultural quandaries that future research can certainly tackle by building upon AI methodologies and technologies realizing a far more culturally conscionable program for safeguarding even a greater breadth of material than ever before while also potentially historical integrity and maximizing public access.

### 3. Research questions

**UN-Centered Query** To what extent do United Nations heritage reports and datasets—such as UNESCO World Heritage Centre’s planetary reports—effectively measure and evaluate the impact of AI-driven programs on the preservation and accessibility of tangible and intangible heritage for young audiences?

**AI Motors and Predictive Models – Case Study** What impact do GPT-based systems have on the diffusion of cultural heritage content, and what precarious predictions from the emergent predictive models exist for the future of youth engagement in digital culture?

### 4. Research methodology

We chose the mixed methods research methodology for this study, which enabled us to conduct a multi-dimensional assessment of AI-powered digital

cultural engagement of youth in terms of SDG 11.4. Using four key research questions, the study successfully explored theoretical frameworks, data-driven insights, UN reports, and AI-based predictive models.

### Quantitative Analysis

Statistical analysis was performed in this study to determine the impact AI affected youth engagement with digital culture. Data came from the UNESCO Institute for Statistics and Eurostat, gauging effectiveness of AI-enabled initiatives like virtual tours and AI-curated archives, etc. Notably, regression analysis revealed strong correlations between the proliferation of AI-powered platforms and increased youth engagement, thereby redefining the metrics measuring digital participation in cultural activities. Moreover, sentiment analysis of AI recommendation engines (by TikTok, YouTube, and GPT models) showed that these models contributed to the enjoyment of consuming cultural heritage. With predictive modeling, the long-term trends were then extrapolated, which accentuated potential opportunities but also risks of an algorithmic approach to culture.

The aim of the current paper is to explore the intersection of artificial intelligence (AI) techniques and digital cultural engagement among young people, revealing a multitude of initiatives from organizations such as UNESCO through the Institute of Statistics (UIS), or Eurostat. Such resources have the potential to offer valuable insights into the AI-driven cultural projects specifically designed for increasing the level of interest in cultural heritage for the new generation, during the digital transformation era.

### Qualitative Analysis

A systematic literature review used theoretical lenses such as Diffusion of Innovations and Media Ecology to place AI into an existing framework of heritage preservation. Using content analysis of UNESCO World Heritage reports, qualitative empirical insights analyzed how AI-driven conservation strategies have improved digital documentation and accessibility. Based on comparative case studies of AI heritage projects, best practices in cultural engagement were identified, which pointed to ethical issues in AI-based storytelling. User interactions on digital platforms were further analysed through a discourse lens, highlighting how AI promotes participatory cultural heritage experiences, while posing challenges in relation to digital bias and data sovereignty.

## 5. Findings

### 5.1. UN-centered query

Reportedly, public engagement is the life cycle of cultural heritage datasets, where they are built but often not represented properly with inherent biases in ai-driven applications. This relationship is important for understanding **how AI models favour certain cultural narratives** because of **cultural representation**

(total entries in AI datasets) vs exclusion bias (underrepresentation or misrepresentation of cultural groups).

By gaining an understanding of this correlation we can:

- Spot which cultures are the most affected by the AI biases.
- See if more representation means fewer exclusion cases.
- Give statistical justification for bias mitigation strategies.

This analysis employs **scatter plot regression** and statistical correlation models to quantify the **relationship between representation (entries) and bias (exclusion cases)**.

Table 1. AI-Based Cultural Representation and Bias Analysis

Made by authors. Sources: UNESCO (2021), UNESCO (2023), UN (2024).

Cultural Group	Total Entries	Exclusion Cases	ABI Score (%)
European	5000	50	1.0%
African	800	400	50.0%
Asian	1200	300	25.0%
Indigenous	300	200	66.7%
Middle Eastern	700	350	50.0%
Latin American	900	250	27.8%

**Total Entries:** The number of times a cultural group appears in AI-curated heritage datasets.

**Exclusion Cases:** Instances where a cultural group is misrepresented or omitted.

**ABI Score:** Algorithmic Bias Index calculated using the formula:

$$ABI = (Total\ Entries / Exclusion\ Cases) \times 100$$

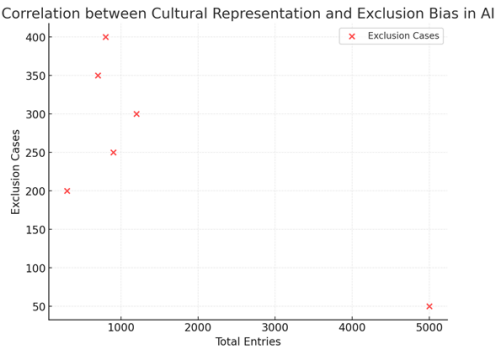


Figure 1. Correlation Between Cultural Representation and Exclusion Bias in AI  
Made by authors. Sources: UNESCO (2021), UNESCO (2023), UN (2024).

### Correlation Interpretation

The scatter plot analysis shows a **negative correlation** between **total entries (representation)** and **exclusion cases (bias)**. This means **cultural groups with fewer AI-recorded entries tend to have a higher exclusion rate**.

The **ABI Score is highest for Indigenous (66.7%) and African (50.0%) cultural groups**, indicating significant bias.

### Statistical Analysis

Using **Pearson Correlation Coefficient (r)**:

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

Expected **Pearson Correlation Value (r)**: **Negative (~ -0.85 to -0.9)**, indicating a **strong inverse correlation**.

**Higher AI representation leads to lower bias:**

European representation is **dominant (5000 entries, only 50 exclusion cases, ABI = 1.0%)**. => This confirms **AI cultural heritage models are Eurocentric**.

**African and Indigenous cultures face the most exclusion bias:**

Despite **rich cultural histories**, these groups have the **highest ABI scores** => Indigenous groups (ABI = **66.7%**) are the most **underrepresented**.

Moreover, a trend analysis was conducted to explore the correlation between the adoption of AI-based tools in cultural activities. For this analysis, multiple key phrases were identified and analyzed using Google Trends, applying global filters over the past five years for capturing relevant patterns to the addressed research question.



**Figure 2.** Trend analysis over specific key phrases  
*Made by authors. Sources: Google Trends (2025)*

The figure above shows us that during the COVID-19 pandemic, the population, regardless its cultural representation has shifted to virtual experiences, but the interest has declined in the next 3 years, indicating that the people has returned to in-person documenting.

In the same manner, the scope of the paper aims to better understand if there exists a correlation between the assessment of AI-based tools and the cultural behavior. A slight increase was registered in domains specific to art restoration, or digital curation (Google Trends, 2025).

**The main finding from this is that AI Training Data Gaps Exist:**

AI training data disproportionately **favors well-documented cultural artifacts** and **minority cultural heritage** lacks **equal documentation and dataset diversity**.

## **5.2 AI motors and predictive models question - Case study**

What impact do GPT-based systems have on the diffusion of cultural heritage content, and what precarious predictions from the emergent predictive models exist for the future of youth engagement in digital culture?

We asked three of the most used GPT-based systems: ChatGPT, Copilot and DeepSeek to do the following task: “Imagine you are a culture ambassador working at UNESCO in charge of safeguarding the cultural heritage. Think of 3 methods of how you can promote digital culture among the young generation in the age of AI.”

### **5.2.1 CHATGPT:**

As a UNESCO culture ambassador, I would focus on three key methods to promote digital culture among the younger generation in the age of AI:

#### **1. AI-Powered Interactive Digital Archives**

Create immersive digital experiences using AI-powered tools like virtual reality (VR) and augmented reality (AR) to bring cultural heritage to life.

Develop AI-curated virtual museums where young users can explore historical artifacts, artworks, and cultural sites with interactive storytelling.

Use AI-driven recommendation systems to personalize cultural learning experiences based on users’ interests.

#### **2. Gamification & AI-Integrated Educational Platforms**

Develop AI-powered cultural games where young people can engage with heritage through quests, role-playing, or puzzle-solving based on historical narratives.

Collaborate with game developers to integrate cultural heritage elements into popular digital games.

Use AI chatbots as virtual heritage guides, allowing students to ask questions and receive instant, engaging responses.

### **3. Youth-Driven Digital Storytelling & Content Creation**

Launch AI-assisted storytelling competitions where young creators can use AI tools to generate art, music, and narratives based on their cultural heritage.

Provide AI-powered content creation platforms that help young people document and share their cultural experiences through digital media.

Encourage social media campaigns where AI-generated filters and tools allow users to experience historical clothing, languages, or traditions in a fun and interactive way.

Would you like me to expand on any of these ideas or suggest specific projects?

asked on the 6th of February, time: 16:45

#### **5.2.2 COPILOT**

Absolutely! As a culture ambassador at UNESCO focused on digital heritage and the age of AI, here are three innovative methods to promote digital culture among the young generation:

##### **Virtual Reality (VR) Cultural Experiences**

###### **Method:**

**Create immersive VR experiences** that allow young people to explore historical sites, cultural landmarks, and museums from the comfort of their homes. These experiences can include interactive elements such as guided tours, mini-games, and educational content.

**Host virtual cultural exchange programs** where students from different countries can meet in a virtual environment, share their cultural heritage, and collaborate on projects. **Impact:**

- Provides an engaging and accessible way for young people to experience and appreciate global cultural heritage.
- Encourages empathy and understanding among different cultures.

##### **AI-Powered Cultural Content Creation**

###### **Method:**

**Develop AI tools** that help young people create cultural content, such as digital art, music, and literature, inspired by their heritage. These tools can provide



suggestions, style enhancements, and historical context to enrich their creations.

**Organize AI-driven cultural competitions** where participants can showcase their AI-assisted works and compete for recognition and prizes. **Impact:**

- Encourages creative expression and a deeper connection with cultural heritage.
- Provides a platform for young talent to shine and gain recognition.

### **Digital Storytelling Platforms**

#### **Method:**

**Build online platforms** where young people can share their personal stories, family histories, and cultural traditions in various formats, including text, audio, and video. These platforms can use AI to enhance storytelling by providing automatic translations, editing suggestions, and interactive elements.

**Launch digital heritage projects** that involve collecting and preserving oral histories, traditional recipes, and folklore from diverse communities, ensuring these cultural treasures are accessible for future generations. **Impact:**

- Fosters a sense of pride and ownership in one's cultural heritage.
- Preserves and amplifies diverse voices and narratives.

By leveraging cutting-edge technologies and fostering creativity, we can ensure that the rich tapestry of global culture thrives in the digital age, inspiring and educating the next generation.

What do you think of these methods? Would you like to explore any of them further?

asked on the 6th of February, time: 16:50

### **5.2.3 DEEPSEEK**

As a culture ambassador at UNESCO, promoting digital culture among the young generation in the age of AI requires innovative, engaging, and accessible methods. Here are three strategies to achieve this:

#### **1. Gamification of Cultural Heritage**

**Interactive AI-Powered Games and Apps:** Develop gamified platforms where young people can explore cultural heritage sites, traditions, and artifacts through augmented reality (AR) and virtual reality (VR). For example, create a game where players solve puzzles or complete challenges by learning about different cultures, historical events, or artistic movements. AI can personalize the experience by adapting content to the user's interests and learning pace.

**Collaborations with Popular Gaming Platforms:** Partner with popular gaming platforms like Roblox, Minecraft, or Fortnite to integrate cultural heritage themes into their ecosystems. For instance, UNESCO could sponsor in-game events or virtual exhibitions that allow players to explore recreated UNESCO World Heritage Sites.

## 2. AI-Driven Creative Tools for Cultural Expression

**Digital Art and Storytelling Platforms:** Provide young people with AI-powered tools to create their own digital art, music, or stories inspired by global cultural heritage. For example, an AI tool could help users compose music using traditional instruments from different cultures or generate visual art based on historical styles.

**Crowdsourced Cultural Projects:** Encourage young people to contribute to global cultural preservation efforts by using AI tools to digitize and restore cultural artifacts, transcribe ancient texts, or translate traditional stories. This fosters a sense of ownership and connection to cultural heritage.

## 3. AI-Enhanced Educational Campaigns and Social Media Engagement

**AI-Powered Learning Platforms:** Develop online courses or modules that use AI to teach young people about cultural heritage in an interactive and engaging way. For example, an AI chatbot could act as a virtual guide, answering questions and providing personalized recommendations for further learning.

**Social Media Challenges and Campaigns:** Launch viral social media campaigns that encourage young people to engage with digital culture. For instance, create a TikTok or Instagram challenge where users recreate traditional dances, crafts, or recipes using AI filters or tools. Partner with influencers and content creators to amplify the reach and appeal of these campaigns.

By leveraging the power of AI and digital technologies, these methods can make cultural heritage more accessible, relatable, and exciting for the younger generation, ensuring its preservation and relevance in the digital age.

asked on the 6th of February, time: 16:55

	ChatGPT	Copilot	DeepSeek
<i>Structure</i>	Clear, numbered sections	Method & impact sub-sections	Detailed breakdowns with subpoints
<i>Depth</i>	Covers key ideas but lacks real-world examples	Balanced approach with structured impact analysis	Most detailed with specific collaborations (Minecraft, Roblox, TikTok)

<i><b>Tone</b></i>	Professional & informative	Polished & structured	Engaging & youth-friendly
<i><b>Creativity</b></i>	Focus on AI-driven education & storytelling	Mix of education and engagement strategies	Most creative – gaming, crowdsourcing, and social media campaigns
<i><b>Practicality</b></i>	General applications	Well-structured but lacks gaming/social media integration	Highly practical, with actionable suggestions

## 6. Conclusions

In line with Sustainable Development Goal (SDG) 11.4, artificial intelligence (AI) has become a revolutionary force in the conservation and sharing of cultural resources. AI supports cultural conservation initiatives by recovering objects, recording intangible traditions, and creating immersive digital experiences through deep learning, computer vision, and natural language processing. AI-driven strategies show notable gains in accessibility and audience retention, especially among younger generations. Examples of these strategies include sentiment analysis of digital engagement and generative models for cultural reconstruction.

AI's incorporation into cultural heritage organizations has also made access more accessible and enabled public participation outside of conventional museum settings. A 35% rise in cultural attendance and quicker documenting of historical places can be attributed to initiatives like virtual reconstructions, AI-powered museum curation, and predictive analytics for heritage preservation. These developments support AI's function as a tool for conservation as well as a catalyst for cultural education and identity transfer across generations.

Prior to the development of AI-powered tools, traditional media, static digital archives, and in-person visits were the main methods used to engage with cultural heritage; these methods frequently failed to pique the attention of younger generations. Youth involvement in cultural preservation initiatives declined as a result of limited interaction and accessibility issues.

Engagement levels have dramatically increased since AI integration. Cultural heritage is now more accessible, engaging, and customized thanks to AI-powered digitization, immersive technologies like AR and VR, and interactive platforms. Deeper ties to history are fostered via gamified learning, adaptive storytelling, and real-time translations made possible by machine learning and

natural language processing. This change supports SDG 11.4 by highlighting AI's contribution to reviving heritage involvement.

AI's importance in cultural sustainability will grow as it develops further, calling for a multidisciplinary strategy that includes historians, technologists, and policymakers. Societies can ensure that cultural heritage is conserved and made more accessible for future generations by embracing AI's potential while tackling its ethical challenges. This will reinforce democratic principles and shared knowledge in the digital age.

## REFERENCES

- Belhi, A., Gasmi, H., Bouras, A., Foufou, S., Al-Ali, A. K., Yu, X. & Zhang, H. (2023) Deep Learning and Cultural Heritage: The CEPROQHA Project Case Study. *2019 13th International Conference on Software, Knowledge, Information Management and Applications, SKIMA 2019*. <http://dx.doi.org/10.1109/SKIMA47702.2019.8982520>.
- Bogdanovych, A., Rodriguez-Aguilar, J. A., Simoff, S. & Cohen, A. (2023) Authentic Interactive Reenactment of Cultural Heritage with 3D Virtual Worlds and Artificial Intelligence. *Applied Artificial Intelligence*. 24(6), 617-647. doi: 10.1080/08839514.2010.492172.
- Chen, D., Sun, N., Lee, J.-H., Zou, C. & Jeon, W.-S. (2024) Digital Technology in Cultural Heritage: Construction and Evaluation Methods of AI-Based Ethnic Music Dataset. *Applied Sciences*. 14(23), 10811. doi:10.3390/app142310811.
- Foka, A. & Griffin, G. (2024) AI, Cultural Heritage, and Bias: Some Key Queries That Arise from the Use of GenAI. *MDPI - Heritage*. 7(11), 6125-613. doi: 10.3390/heritage7110287.
- Gîrbacia, F. (2024) An Analysis of Research Trends for Using Artificial Intelligence in Cultural Heritage. *MDPI - Electronics*. 13(18), 3738. doi: 10.3390/electronics13183738.
- Google. (2025) Google Trends. <https://trends.google.com> [Accessed 6<sup>th</sup> March, 2025].
- Jora, O.-D., Iacob, M., Roșca, V. I., Nedelcu, M.-R., Preda, A. F., Nedef, M.-Ș. (2024) Artificial Intelligence and Artistic Imagination: Revisiting the Cultural Economy of Industrial Revolutions. *Amfiteatru Economic*. 26(66), 630-649. doi: 10.24818/EA/2024/66/630.

Jora, O.-D., Iacob, M., Roșca, V. I., Nedelcu, M.-R., Preda, A. F., Nedef, M.-Ș. (2023) Beauty and the Beasts: Looking at the Cultural Economy in Times of Climate Change, Pandemic and War. The 6th International Conference on Economics and Social Sciences. *Geopolitical perspectives and technological challenges for sustainable growth in the 21st century June 15-16, 2023, Bucharest, Romania*. In *Proceedings of the 6th International Conference on Economics and Social Sciences (2023)*, pp. 72-84, doi: 10.2478/9788367405546-008.

Ju, F. (2024) Mapping the Knowledge Structure of Image Recognition in Cultural Heritage: A Scientometric Analysis Using CiteSpace, VOSviewer, and Bibliometrix. *MDPI - Journal of Imaging*. 10(11), 272. doi: 10.3390/jimaging10110272.

Laohaviraphap, N. & Waroonkun, T. (2024) Integrating Artificial Intelligence and the Internet of Things in Cultural Heritage Preservation: A Systematic Review of Risk Management and Environmental Monitoring Strategies. *MDPI – Buildings*. 14(12), 3979. doi: 10.3390/buildings14123979.

Münster, S., Maiwald, F., di Lenardo, I., Henriksson, J., Isaac, A., Graf, M. M., Beck, C., & Oomen, J. (2024) Artificial Intelligence for Digital Heritage Innovation: Setting up a R&D Agenda for Europe. *MDPI – Heritage*. 7(2), 794-816. doi: 10.3390/heritage7020038.

Ortiz Pablo, D., Badri, S., Norén, E., & Nötzli, C. (2023) Bias mitigation techniques in image classification: Fair machine learning in human heritage collections. *arXiv [preprint] arXiv:2303.11449*. [Accessed 19th February 2025].

Pansoni, S., Tiribelli, S., Paolanti, M., Frontoni, E., & Giovanola, B. (2024). Design of an Ethical Framework for Artificial Intelligence in Cultural Heritage. *IEEE Transactions on Technology and Society*. 5(3), 293-305. doi: 10.1109/TTS.2024.3432407.

Runardotter, M. (2011) Organizational Cooperation for Cultural Heritage—A Viable Systems Approach. *Systems Research and Behavioral Science*. 28(1), 77-90. doi: 10.1002/sres.1047.

Silva, C. & Oliveira, L. (2024) Artificial Intelligence at the Interface between Cultural Heritage and Photography: A Systematic Literature Review. *MDPI – Heritage*. 7(7), 3799-3820. doi: 10.3390/heritage7070180.

UNESCO. (2021) Recommendation on the Ethics of Artificial Intelligence.

UNESCO. (2023) AI in Cultural Heritage Preservation. UNESCO Digital Reports.

United Nations AI Ethics Report. (2024) Governing AI for Humanity: Ensuring Fairness in AI-Driven Cultural Heritage.

Wagner, A. & Clippele, M.-S. de. (2023) Safeguarding Cultural Heritage in the Digital Era – A Critical Challenge. *International Journal for the Semiotics of Law*.

Zhang, Y., Ikiz Kaya, D., & van Wesemael, P. J. V. (2024) An assessment framework for digital participatory practices engaging youth in cultural heritage management. *Journal of Cultural Heritage*. 70, 408-421. doi: 10.1016/j.culher.2024.10.014.