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Infrastructures for Digital Arts Teaching and Research in Higher Education (LeFo): The “Connecting New Media Art Archives Worldwide” Initiative

Abstract

The project titled “Infrastructures for Digital Arts Teaching and Research in Higher Education” (LeFo) funded by the BMBWF between 2020 and 2024 is being carried out at the University of Continuing Education Krems, the University of Arts Linz and the University of Applied Arts Vienna. In addition to the expansion of the *Archive of Digital Art* (ADA) for research and teaching at universities and the development of innovative New Media Art documentation with VR and mixed-reality experiences, the project supports the establishment of a global network of New Media Art archives. This paper focuses on the (pre)history, special challenges and selected solution approaches of the initiative to date.

Keywords

archives, networks, new media art, collaboration

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1 The Archive of Digital Art

Since its beginnings in the 1960s, New Media Art has occupied an important place in our cultural heritage (GRAU et al., 2019). It often addresses important and very current social issues such as media revolution, politics, climate change, surveillance, identity, feminism, virtualization of global finance, among others (see for instance GRAU & HINTERWALDNER, 2021). However, due to its dependency on ever rapid-evolving technology as a foundation (for example recognized sub-genres include software art, computer animation, and computer graphics generally), it can be very difficult to re-exhibit important New Media artworks created as recently as only ten years ago. New Media Art thus poses a challenge to traditional preservation and archiving practices (GRAU et al., 2019, p. 436).

The *Archive of Digital Art* (ADA), the former *Database of Virtual Art*, has consciously taken up this challenge since its founding in 1999 by Oliver Grau.² Particularly important is the “expanded concept of documentation” developed by Oliver Grau especially for New Media Art, which, among other things, pays special attention to the technical aspects and precise documentation of the spatial installation of the works as well as their exhibition history and research (GRAU, 2003). The documents are made available to ADA by artists and scholars from all over the world; the documentation archive is thus characterized by a collaborative approach. A special gate-keeping system and an editorial team ensure the quality of the contributions to the archive (GRAU et al., 2019, p. 437). The editorial team also supports the growth of ADA’s international community for instance with artist features, online exhibitions and further research on artworks in ADA.

Since 2006, ADA has been located at the University for Continuing Education Krems (Austria) at the Center for Image Science (Department for Arts and Cultural Studies) and has been continuously technically updated and further expanded since then.³ This has enabled ADA to develop into the leading online repository for New

2 *Archive of Digital Art* (ADA), <https://digitalartarchive.at/>, accessed on August 15, 2023.

3 Among other things, ADA was extended with Web 2.0 features for the archive community and the image-historical analysis of media artworks was supported with a “bridging thesaurus” in a project funded by the Austrian Science Fund (FWF) from 2013–2016 (GRAU et al., 2019).

Media Art. As of 2023, almost 1,000 acclaimed artists and scholars specialized in New Media Art are represented in ADA, each with a detailed documentation of their work and research. Currently, the project titled “Infrastructures for Digital Arts Teaching and Research in Higher Education” (“Lehr- und Forschungsinfrastruktur für Digitale Künste an Hochschulen”, LeFo) co-funded by the Austrian Federal Ministry of Education, Science and Research (BMBWF) from 2020 until 2024 is being carried out by a consortium formed by the University of Continuing Education Krems as project lead, together with the University of Arts Linz and the University of Applied Arts Vienna as project partners.⁴

In the LeFo project, ADA is being expanded into an open science data infrastructure, especially for teaching and research at universities by adoption of standards such as BibTEX⁵ for bibliographical references and IIIF⁶ for the interchange of digital images, and the release of newly developed code under the Creative Commons license in accordance with the FAIR principles. Among other things, the archive content has been increased and innovative search tools and data visualizations have been developed. Furthermore, future-oriented forms of documentation for digital art have been created that expand traditional archive perception. Thus, VR and mixed-reality experiences now allow virtual exploration of the *AR[t]chive* of the Sommerer/Mignonneau collective, the performance *Swarming Lounge* by Kondition Pluriel, and re-presentations of selected works by Ruth Schnell. In addition, the establishment of

4 The following staff members work(ed) on the LeFo project at the three Austrian universities: University of Continuing Education Krems: founder of ADA, concept & project management / PI until June 2022: Oliver Grau, LeFo project lead since July 2022: Viola Rühse, LeFo research team: Carl Philipp Hoffmann, Michael Perl, Max Resch, Alejandro Quiñones Roa, Carla Zamora Campos; University of Arts Linz: project lead: Laurent Mignonneau, Christa Sommerer, interface design & research “AR[t]chive”: Tiago Martins; University of Applied Arts Vienna: project lead: Martin Kusch, Ruth Schnell, interface design & research (VR/HoloLens): Thomas Hochwallner, Johannes Hucek.

5 BibTEX is a tool and a file format which are used to describe and process lists of references (<https://www.bibtex.org>, accessed on August 15, 2023).

6 IIIF (International Image Interoperability Framework) is a set of open standards for delivering high-quality, attributed digital objects online (<https://iiif.io>, accessed on August 15, 2023).

an international network of archives for New Media Art is significantly supported. To this end, the LeFo project participates in an international working group for connecting new media art archives, which is expanded on in the following section. The focus of this article is on the (pre)history, special challenges and selected solution approaches of this initiative to date.⁷

2 Connecting New Media Art Archives

For about 25 years, there has been a lively debate about New Media Art, in dedicated conferences, various preservation projects, online platforms for documenting New Media Art founded throughout the world. Some important documentation and research projects have however already disappeared from the web. Some of them are still online, but their key researchers are no longer responsible for them, and the funding has expired (GRAU et al., 2019, p. 436). Furthermore, there is as yet no meta-archive or meta-catalog available to facilitate research and discovery of documentation across diverse “siloes” of New Media Art, nor is there a list-like overview of the wide variety of archives documenting New Media Art worldwide. This currently makes it difficult for researchers, teachers, and students to engage with New Media Art as they sometimes have very difficult access to important materials (MITCHELL et al., 2022, p. 455).

For instance to better advocate for the sustainable preservation and further development of New Media Art documentation projects as an important part of cultural heritage and to support the discoverability of accurate and comprehensive information through archival networking, the “Connecting New Media Art Archives Worldwide” initiative was founded in 2020 by representatives of several important New

7 The proceedings from past and current ISEA Symposia and Archiving Summits are available at <https://www.isea-archives.org/proceedings-catalogues>, accessed on August 15, 2023. Results from the other project areas were presented at the Ars Electronica Festival in September 2023, among other things. – To date, there have been two shorter reports published on the Connecting Archives initiative dating back to 2022, which are supplemented here with the latest developments in the initiative and a special focus on LeFo: MITCHELL, SEARLEMAN, VAN DER PLAS & WONG (2022b); MITCHELL, MAHAJAN, WILSON & GRAU (2022a).

Media Art archives (Figure 1) (MITCHELL et al., 2022b, p. 455). The core group of this network includes the archive of the International Symposium on Electronic Art (ISEA, currently headquartered at the University for the Creative Arts in the United Kingdom), the ACM SIGGRAPH Art Show Archive of the Association for Computing Machinery (ACM, based in the U.S.), Festival of Electronic language (FILE, based in Sao Paulo in Brazil), and the Austrian Ars Electronica Archive based in Linz and ADA (MITCHELL et al., 2022b, p. 456–459).⁸ This initiative was included in the 2019 LeFo project grant application and has been supported since the project began.



Figure 1: A vision of the initial international archives network (picture source: MITCHELL et al., 2022b, p. 456, fig. 1).

8 For more information on the mentioned archives in addition to ADA see also: ISEA archive: <https://www.isea-archives.org/>, last accessed on August 15, 2023; the ACM SIGGRAPH Art Show Archive evolved in the ACM SIGGRAPH History Archive: <https://history.siggraph.org/>, last accessed on August 15, 2023; FILE archive <https://archive.file.org.br/>, last accessed on August 15, 2023; Ars Electronica archive: <https://ars.electronica.art/about/en/archive/>, <https://archive.aec.at/>, last accessed on August 15, 2023.

3 (Pre)History

The initiative for connecting New Media Art archives worldwide has a longer history, which is briefly outlined below. Back in 2011, a declaration signed by nearly 600 artists and scholars from around the world pointed out, among other things, the urgent importance of a “global networked collaboration” for documenting and researching New Media Art.⁹ The topic, with particular attention to a collaboration on archiving New Media Art and an appropriate structure and funding, was taken up first at a roundtable at ISEA2018, the 24th International Symposium on Electronic Art, in Durban, South Africa and then with a particularly large number of participants at a roundtable at ISEA2019 in Gwangju, South Korea.¹⁰ During ISEA2020, a one-day summit on archiving New Media Art was organized by ISEA Archives, ADA, Ars Electronica Archives, and SIGGRAPH Art Show Archives (MITCHELL et al., 2022, p. 456). The summit organizers were then joined by FILE to form a core group for the Connecting New Media Art Archives initiative. Since then, regular video conferencing meetings between the representatives from the participating organizations have taken place. They have exchanged technical expertise, methodologies and ideas in an effort to create a structured, inclusive and open data approach to connect archives that contain information related to New Media Art. In addition, ISEA archivists have so far initiated further summits on New Media Art archiving in 2022 and 2023 in partnership with other archives during the ISEA event. During these summits, the conceptual, procedural, and technical work results of the Connecting Archives initiative were presented (Figure 2).¹¹

9 Media Art Needs Global Networked Organisation & Support. International Declaration, 2011. https://www.mediaarthistory.org/?page_id=557, last accessed on August 15, 2023; see also GRAU et al., 2019, p. 436.

10 Announcement of the Summit on New Media Art Archiving, ISEA2020 (16 October 2020). *ArtHist.net*, October 12, 2020. <https://arthist.net/archive/23689>, last accessed on August 15, 2023.

11 MITCHELL et al., 2022b; MITCHELL et al., 2022a; B. L. MITCHELL et al. (2023, May 16–21), Globally Connecting New Media Art Archives: Progress, Goals and Challenges. [Conference Presentation] 28th International Symposium on Electronic Art, Paris, France. <https://isea2023.isea-international.org/>, last accessed on August 15, 2023.



Figure 2: ISEA2023 Globally Connecting New Media Art Archives: Progress, Goals and Challenges. Panel Participants: Bonnie Mitchell, Carl Philipp Hoffmann, Paula Perschinotto, Terry Wong (picture credit: Dr. Tiago Martins).

4 Challenges and Approaches to Solutions

The five archives have joined the core group also because their data are similar (MITCHELL et al., 2022b, p. 456). Nevertheless, there are differences due to different origins, histories, purposes and governance and therefore different content foci and underlying data infrastructures. For example, as described above, ADA is a collaborative archive that has recently been expanded in a research project, while the Ars Electronica archive documents specific artefacts and projects presented for instance at a particular exhibition and is maintained by a permanent institution. The ACM SIGGRAPH History Archive (the former ACM SIGGRAPH Art Show Archive) is a volunteer-based organization that is processing a backlog of content. Given the different purposes, maturity, and resources of our overlapping collections, the extent of information may vary between archives.

For this reason, the LeFo project surveyed the information held in each participating archive by creating a common data model for analysis. By examining the model, the project has identified an architecture for matching and reconciling data between archives, based on Wikidata, a “free and open knowledge base that can be read and edited by both humans and machines”.¹² Data were nominated related to “persons” (nominally artists) as a starting point for developing an architecture for prototype integration. Through the use of a central hub, an archive will be able to indicate

¹² Introductory information on the Wikidata main page, www.wikidata.org, last accessed on August 15, 2023. – Wikidata acts as central storage for the structured data of its Wikimedia sister projects including Wikipedia, Wikivoyage, Wiktionary, Wikisource, and others.

that it has content about a particular person, thus providing an opportunity for other archives to match this information with their own, and to link to other repositories with information documenting the same person.

The degree of successful matching can be extended by adding secondary, tertiary or other criteria such as phonetic matches, dates of birth, etc., using the OpenRefine tool to assist the matching process.¹³ LeFo will continue to develop its enhancement of ADA's connection to other archives using this hub-based approach to normalization of data and integration between archives. Recently, this same approach to data matching and establishing references to matching information between archives has been successfully prototyped by the US-American Smithsonian Institution, validating the architecture independently developed by LeFo and its partners (EVENHAUGEN, 2022).

Progress has also been made to establish the shared data connection to Wikidata and automating the display of links to other archives if the person exists in more than one. Each of the participating organizations is also actively engaged in functional improvements to their own archive which both hinders and facilitates the advancement of our unified efforts. Collectively these organizations are identifying challenges such as intermittency of resources, coordination between overlapping and incongruent information structures, and the long-term sustainability of connecting archives. Ultimately the aim is to enable other archives to join the initiative, thus creating a unified world-wide network of New Media Art archives.

5 Conclusion

The LeFo project, through its participation in the Connecting New Media Art Archives Worldwide initiative, has been developing a methodology to enable information sharing between currently 'siloe'd' online repositories of New Media Art. With representatives from collections around the world, this work in progress highlights technical, resource and coordination challenges. To mitigate and adapt to such constraints, a clear articulation of the purposes of the connection can help to identify

13 OpenRefine is an open-source application, <https://openrefine.org/>, last accessed on August 15, 2023.

functional requirements and thus provide direction for technical choices. Accuracy, integrity and traceability are our core principles. By creating an automatable methodology, the overarching goal of creating a network of interconnected knowledge related to New Media Art comes closer to realization.

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