

A close-up photograph of a person's face, heavily color-cast with shades of blue and purple. The person's eyes are closed, and their expression is serene. The lighting is dramatic, highlighting the contours of the face.

Second Summit on  
New Media Art Archiving

# Proceedings

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# About the 2nd Summit on New Media Art Archiving

## Introduction

The need to preserve the history of the rapidly evolving field of new media arts has spurred the development of a wide variety of new media art archives throughout the world. Museums, cultural and educational institutions, as well as individuals with collections have developed, or are planning to create physical and/or online archives in an effort to preserve important artifacts and document events and creative works. The Second Summit on New Media Art Archiving aims to facilitate critical discourse and collaboration amongst archivists, curators, artists, researchers, and other parties interested in preserving the past. This summit serves as an incubator of innovative ideas, production techniques, and infrastructure development as well as assist in connecting like-minded individuals in an effort to create a unified approach to solving the complex problem of preserving the history of new media art.

The Second Summit on New Media Art Archiving has taken place during ISEA2022 in 10-11 June 2022, and has organised by ISEA2022 Barcelona, the ISEA Symposium Archives, and SIGGRAPH History Archive, in cooperation with the Barcelona Museum of Contemporary Art (MACBA), FILE Festival archive, ADA Archive of Digital Art and Ars Electronica archive.

**Second Summit on  
New Media Art Archiving**

**ISEA2022 Barcelona  
10-16 June 2022**

# **-Invited Talks-**

# Revealing Higher Impact of Media Art Archiving

**Oliver Grau (PI), Laura Ettel, Philipp Hoffmann, Alexander Wöran and Carla Zamora**

University for Continuing Education  
Krems, Austria  
oliver.grau@donau-uni.ac.at

## Abstract

Media art poses a multitude of specific challenges for archiving, e.g., the weak interconnection of thematically similar archives. Furthermore, digital tools developed for image analysis as well as art research usually fall short when confronted with media art. LeFo and ImDaLi, the projects presented here, intend to address these issues in their research.

## Keywords

Media art archiving, image analysis, media art research

## Introduction

The field of media art holds a special position in art research and archiving due to its process-oriented, methodological and disciplinary diversity. Considering the ongoing technological developments in general and particularly in the digital field, which are rapidly finding their way into the production of media art, as well as the constant transgression of boundaries between different areas of knowledge, archiving strategies and digital tools developed are not always optimally suited for digital art. In order to do justice to the broad spectrum and fast-moving nature of media art production in the context of scientific research, the projects LeFo and ImDaLi set out to develop interactive and immersive virtual spaces optimized for media art. Both are focused on creating new prospects for the exploration of perception and the value of collections. ADA (*Archive of Digital Art* [www.digitalartarchive.at](http://www.digitalartarchive.at)) is a community platform for the documentation of media art, which gathers hundreds of leading artists and scholars and over 50000 documents. It serves as foundation for innovative strategies and applications developed within the projects.

## Infrastructures for Digital Arts Teaching and Research in Higher Education (LeFo)

LeFo extends the Archive of Digital Art as a platform for research and teaching of themes emergent from the field of Media Art. ADA is a community archive of selected artists that documents significant media artworks supporting technical documentation, like interfaces etc. developed by

the artists. In order to extend the platform as a teaching tool, the project extends the ADA collection and integrates visualizations of the archive's content, themes, tools and practices as a research methodology. Additionally, LeFo is developing Augmented Reality interfaces to the archive's collection, thus investigating new paradigms for presenting and navigating digital collections. Most ambitiously it will also develop technical foundations for connecting disparate but thematically aligned online archives so that content is directly discoverable and comparable across overlapping collections, reinforcing the value of each platform in the context of research and teaching in media art.

## Tool Development for Image Data Literacy (ImDaLi)

ImDaLi researches and designs digital tools for image databases with the aim of both improving the user experience when using archive platforms and testing different approaches to digital image analysis. To reach these goals, ImDaLi addresses two core topics within its research. Firstly, the controlled vocabulary of the Thesaurus, which already encompasses keyword-tags for the numerous artworks within ADA, is used for extensive analysis to explore visualization concepts that contribute to media art research. Furthermore, it will be explored if and how the Thesaurus could potentially enrich semantic web data on media art to further interconnection and integration among media art archives. Epistemological structures of archives however, often developed organically over time and are thus modeled around their respective needs. Consequently, basic alignment of vocabularies anchored in a mutually accepted standard (like the Getty Art and Architecture Thesaurus) is a prerequisite for improving the accessibility of content across databases. Secondly, the Lightbox tool already available to users on ADA is further developed for in depth image analysis. Starting from Aby Warburg's approach of comparative iconography, which focused on the analysis of semantic and visual connections between artworks, the Lightbox will be adapted for the analysis of media art, e.g., 3D viewing allowing for experiences of a work of art within the digital realm.

# ISEA Symposium Archives: Progressing from the Past to the Future

**Bonnie Mitchell, Jan Searleman, Wim van der Plas, Terry C. W. Wong**

Bowling Green State University, Clarkson University, ISEA Symposium Archives, Simon Fraser University  
Bowling Green, OH, USA; La Jolla, CA USA; Rotterdam, NL; Vancouver, CA  
bonniem@bgsu.edu; jetsza@gmail.com; wvdplas@xs4all.nl; terrywong.cw@gmail.com

## Abstract

The ISEA Symposium Archives have undergone significant changes in the past 8 years but in 2021, the project reached a milestone. All the information had been moved from the Classic archive to the New archive, therefore the focus transitioned from data input and basic development to finding missing information, fixing errors, developing structural consistency, cleansing the data, adding videos and developing features that would enable us to connect to other archives. Although the ISEA archives are far from complete, this shift of focus has broadened our vision and enabled us to enhance the usefulness of this valuable resource.

## Keywords

archive, new media art, online repository, electronic art, digital art

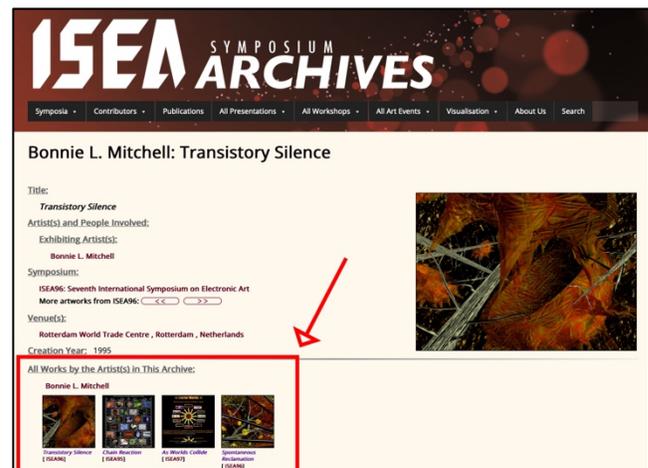
## Introduction

The current ISEA Symposium Archives initiative began with the goal of documenting all past ISEA symposia and making this information publicly available on the web. The information from the original ISEA archive was ported to a simple WordPress site and the team spent years adding additional information to this static website. Realising the potential of connecting the data to create complex relationships, we built a structurally more complex system and embarked on a new phase of the project. The primary goal was to move the information from the ISEA Classic Archive and to the various fields in this new system. With over 18,000 entries to add, this required a lot of unpaid volunteer effort and time. In 2021, we completed the transition of data and refocused our energy on the next phase of the project.

## Content Correction and Analysis

The new ISEA Symposium Archive requires that the data be added to individual fields thus eliminating the possibility of a direct export and input of the data between the archives. When entering data bit by bit, it is difficult to see the big picture. The ISEA symposium is hosted in a different

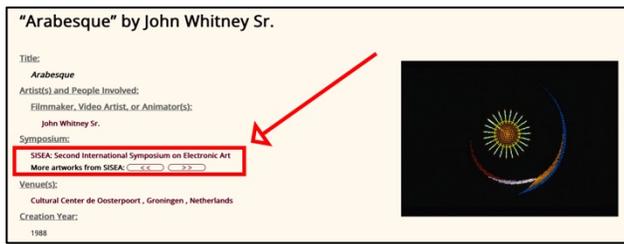
country and organised by a new group of people each time, so the structure of the data differs from year to year. By creating year-to-year analysis charts of the structure of the data entered in the archive, we were able to easily spot and correct inconsistencies. We also enhanced our export feature and wrote a program using Python and fuzzy logic to compare people names in our database with other databases. This complex code looked for duplicate and similar names (such as nicknames, married names, etc.) and calculated the percentages of a match. This process enabled us to detect over 350 duplicate people entries in our own archive which took months to fix. We also restructured the way the archive deals with artist collective names so the members are dynamically linked to the collective name. In the past, a collective was treated the same as a “Person” entry thus limiting its dynamic relationships. These are a few of the “fixes” that have occurred over the past year.



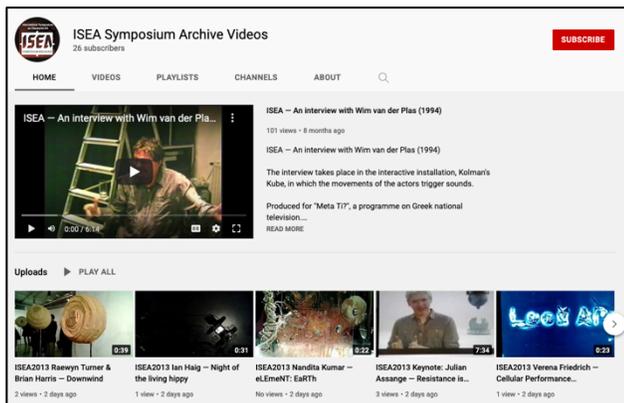
## Enhancements

By identifying the many ways in which a researcher may want to traverse the archive, we identified major user interface enhancements to make the process easier. On the art event pages, we added a feature to show icons (with links) of all other art events by the contributors. We added

the ability to go to all the other art event entries related to a symposium within a single art event entry.



We also started a Youtube channel and we digitised scores of VHS and UMatc tapes and embedded those in the archive.



More images were added to the archive and some of the missing information was found. We are now in the process of proof-reading and correcting all the entries in the archive and training new volunteer interns to help with this task. We welcome feedback from users and hope they will help test the usability and accuracy of the new archive.

## The Future

Although there is much more to be done in regards to adding information and fixing problems, our recent focus has been to create the ability to connect with other new media art archives around the world. We added the ability to detect if a person has an entry in another archive and if so, display an icon with a link to the other archive. This feature prepares the ISEA archive to become part of a world-wide distributed network of new media art archives. These efforts further our goal to provide access to information about ISEA's past as well as paves a path forward into the future.

## Biographies

Bonnie Mitchell (Ohio, USA) is a digital artist, animator, archivist as well as a professor of Digital Arts at Bowling Green State University. Mitchell's artworks explore spatial and experiential relationships to our physical, social, cultural and psychological environment through interaction and physical immersion. Her creative work includes interactive installation art, environmental data visualization

art, experimental visual music animation, net-art, and new media art archive development. Mitchell is the co-director of the SIGGRAPH History and ISEA Symposium online Archives and also a member of the organizing team of the Summit on New Media Art Archiving (first held in 2021 online and again in 2022 in Barcelona). She is also a member of the ISEA International Advisory Committee, the ACM SIGGRAPH History and Digital Arts Committees and is the SIGGRAPH 2023 History Chair in charge of the 50th conference celebration.

Jan Searleman (California, USA) taught Computer Science at Clarkson University for 37 years, retired in 2015, and since retirement has been an Adjunct Research Professor at Clarkson. Her research areas are Virtual Environments, Human-Computer Interaction, and Artificial Intelligence. A senior member of the ACM, Jan is also on both the ACM SIGGRAPH Digital Art Committee (DAC) and the ACM SIGGRAPH History Committee. Jan and Bonnie Mitchell coordinated the DAC Online Exhibition "The Earth, Our Home: Art, Technology and Critical Action". She co-moderated SPARKS talks (Short Presentations of Artworks and Research for the Kindred Spirit) for DAC on "Robotics, Electronics, and Artificial Intelligence" with Hye Yeon Nam, and "Data: Visual Perception, Interpretation and Truth" with Everardo Reyes. Jan co-directs, along with Bonnie Mitchell, the ACM SIGGRAPH History Archive. She also co-directs the ISEA Symposium Archive with Bonnie Mitchell, Wim van der Plas and Terry C.W. Wong.

Wim van der Plas (Netherlands) studied Social & Cultural Sciences at the Erasmus University Rotterdam. He was director of the Foundation for Creative Computer Applications (SCCA, Rotterdam), R&D staff of the Utrecht School of Arts, managing director of the Institute for Computer Animation (SCAN, Groningen), and worked for 3 different departments of the Utrecht University of Applied Sciences. He is co-founder of ISEA, organised the first, second and seventh ISEA symposium and served as ISEA HQ and on the ISEA board since its founding. Currently he is co-director of the ISEA symposium archives and member as well as honorary chair of the ISEA International Advisory Committee. In 2018 he received a Leonardo Pioneer Award.

Terry C. W. Wong has a Bachelor's degree from the Applied Science Department of the University of British Columbia and a Master's degree in Fine Art at the Chinese University of Hong Kong. Currently, he is working on his graduate degree in the School of Interactive Arts and Technology at Simon Fraser University. He is doing his research study on connecting new media art archiving worldwide. Terry is also an archivist and co-organizer for the ISEA Symposium Archives. He was also on the organizing team of ISEA2016 in Hong Kong.

# Ars Electronica Archive

Christina Radner

Ars Electronica

Linz, Austria

Christina.Radner@ars.electronica.art

## Abstract

The Ars Electronica Archive contains documentation of content since the start of Ars Electronica in 1979. A huge number of artists and researchers from the field of art, technology and society were part of Ars Electronica activities during more than 40 years. They have left their traces in the archive. The presentation provides a glimpse into what the Ars Electronica Archive is and stands for, and what the current achievements and challenges are. Part of the archive is accessible online (Online Archive), part of it only internally (physical Archive & Internal Database).

## Keywords

online archive, media art, festival, prix ars electronica, hack attack, challenges, growing

## Ars Electronica Archive

Ars Electronica, based in Linz, Austria, and founded in 1979, holds one of the world's largest archives of digital media art. Everything started with the first Ars Electronica Festival in 1979. Next to the Festival the Prix Ars Electronica (yearly competition in several categories, initiated in 1987) and the Ars Electronica Center (museum, open to the public year-round) came into being first, followed by several other divisions. Currently Ars Electronica can be described as stage and competition for media art, festival for art, technology and society, showcase for creativity and innovation, laboratory for research and development, and school of the future. [1]

The Ars Electronica Archives mission is to preserve the ideas and the diversity of Ars Electronica, and to make as much of it as possible freely accessible to users. It's holdings include a diverse array of art works and documentation of projects, exhibitions and activities from the Ars Electronica context and across the entire spectrum of media art throughout the world. Highlights are the winning projects of Prix Ars Electronica in the Prix Online Archive, and video documentation of the early Festival years and Center exhibitions, which was possible through the involvement of the ORF – Austrian Broadcasting Company's Upper Austria Regional Studio at that time [2].

Part of the Ars Electronica Archive is accessible online (Online Archive, Figure 1), part of it only internally (physical Archive & internal Database). Currently the biggest challenges of the Archive are: a) to bring "old" festival websites, placed on an old server structure, back to visibility and usability for researchers (first festival website is from 1995). And b) to deal with the huge amount of newly produced content, arisen especially because of the hybrid format of the Festival in the last two years (video files exploded in terms of amount and file size).

Constantly growing, the archive forms the link between the past and the present. In its continuity and amount of content, it invites to dive into it, to look for changes over time in focus or for example file format or picture quality [3], as well as to research about single artists, works and activities.



Figure 1. Ars Electronica Online Archiv, <https://archive.aec.at/>. ©Ars Electronica.

## References

- [1] History Area at the Ars Electronica Website, accessed April 19, 2022, <https://ars.electronica.art/about/en/history/>. And: Andreas J. Hirsch, *Creating the Future. A Brief History of Ars Electronica 1979 – 2019*, (Hatje Cantz, 2019).
- [2] Martina Hechenberger, Theresa Schubert Minski, "The Ars Electronica Archive", in: *The Big Picture – New Concepts for a New World*, (Hatje Cantz, 2012), S. 388.

[3] Christina Radner, The Different Appearances and Roles of Photographic Images in the Ars Electronica Archive, in: *PhotoResearcher* No 33 (2020), S.128-141.

### **Author(s) Biography(ies)**

Christina Radner (AT) currently is the responsible project manager for the Ars Electronica Archive in Linz, Austria. In 2009 she got

her master's degree in art history at the University of Vienna. At an internship at the Art Brut Museum Gugging in Klosterneuburg near Vienna, she got a first insight into the archive work of a museum. She was hired project-based, to help work on an artist's estate and to prepare a retrospective and a comprehensive catalogue of works. In 2013 she moved back to Upper Austria and started her work in the Ars Electronica Archive Team. Since 2015 she is the responsible project manager for the Archive and part of the Festival/Prix/Archive Core Team of Ars Electronica.

# FILE ARCHIVE

**Paula Perissinotto, Fabiana Krepel**

FILE FESTIVAL INTERNACIONAL DE LINGUAGEM ELETRONICA

São Paulo, Brasil

paula@file.org.br, fabiana@file.org.br

## Abstract

The presentation is about the digital archive of FILE - Electronic Language International Festival. FILE ARCHIVE is an initiative carried out by the independent cultural non-profit organization FILE – International Electronic Language Festival – and aims to make available and share its collection, which brings together 22 years of achievements, in an accessible and free online environment. This expanding collection makes available the last 5 years of FILE FESTIVAL events and exhibitions (2017 -2022), through the free software TAINACAN.

## Keywords

digital file; digital memory; cultural memory, digital platform, database, digital repository.

FILE ARCHIVE is an initiative carried out by FILE – International Electronic Language Festival – and aims to make available and share its collection, which brings together 22 years of achievements, in an accessible and free online environment.

From the emergence of the avant-garde of electronic art in Brazil to the rise of interactivity in exhibition spaces, the Festival is present in the Latin American scene as a cultural platform of international visibility that promotes aesthetic, cultural and scientific manifestations; produced in the field of art in the digital age.

Throughout its history, FILE has constituted a unique collection of its kind, having held 49 exhibitions and exhibited more than 8,000 national and international works. The Festival also visited 6 Brazilian states and exhibited artists from 48 countries.

This constantly expanding collection is now available through the free software TAINACAN, developed in Brazilian universities and a product of the work developed at the Faculty of Information Science at the University of Brasília. FILE ARCHIVE currently makes available the last 5 years of FILE FESTIVAL events and exhibitions (2017 - 2022), including archives in different formats, such as digitized publications, biographies, synopses, photographic records of exhibitions and works, as well as information

about symposia, workshops, artistic performances and festival awards, to be shared with the different audiences as illustrated in Figure 1, Figure 2, Figure 3, Figure 4 and Figure 5.



Figure 1. Launched 02/2022. © Copyright. FILE FESTIVAL



Figure 2. FILE ARCHIVE homepage. © Copyright. FILE FESTIVAL

The final structure of FILE ARCHIVE digital repository was composed of 8 collections, where each of them contains specific metadata of different typologies, such as: Artworks, Participants, Events, Educational Activities, Venues, Publications & Media, Physical Archive, Registration form.

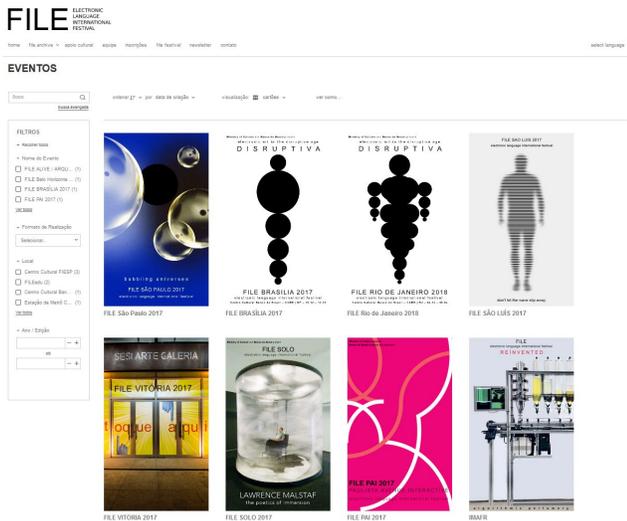


Figure 3. FILE ARCHIVE, Events Collection. © Copyright. FILE FESTIVAL

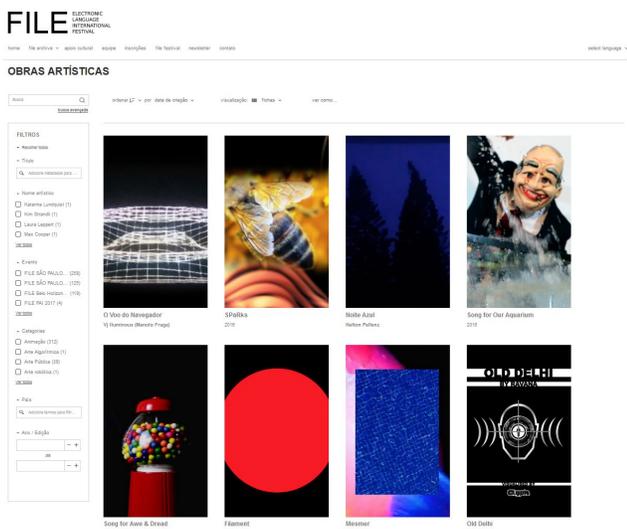


Figure 4. FILE ARCHIVE, Artworks Collection. © Copyright. FILE FESTIVAL

The result of this project offers the public interested in the field of art and technology online access to organized information and contributes to facilitating, to all interested scholars, the means for free access to the information in this collection. In this way, we support, value and disseminate the festival's content, in addition to preserving the material and immaterial assets of the international and historical cultural heritage created by a Brazilian initiative.

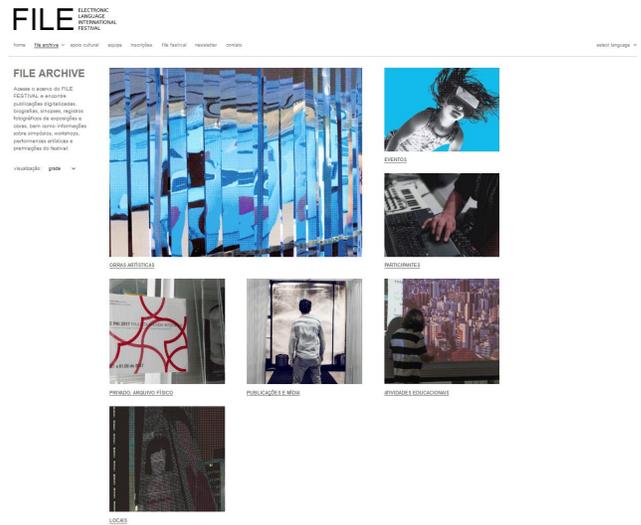


Figure 5. Collections of FILE ARCHIVE. © Copyright. FILE FESTIVAL

### Author(s) Biography(ies)

Paula Perissinotto is specialized in new media, contemporary art and digital culture. Master's degree in visual poetics from ECA (School of Communications and Arts at USP University of São Paulo). Since 2000 I have been working as Co- organizer and Co-curator of FILE, Electronic Language International Festival, a non-profit cultural organization that promotes and encourages aesthetic and cultural productions related to the new poetics of contemporary culture. At the festival, is responsible for the selection of works, international relations and also calls for project management carried out in Brazil. Have produced and realized 50 art and technology exhibitions. Current is a PHD student at the University of São Paulo, School of Communications and Arts | ECA, in Visual Poetics. Member of the Realidades Research Group licensed by CNPq, led by Prof. Dr. Silvia Laurentiz who in turn, is formally affiliated with the School of Communications and Arts and the Department of Visual Arts, ECA / USP.

Fabiana Krepel is a Food Engineer graduated from Unicamp University, and post-graduated in marketing from ESPM. She holds a Graphic Design Certificate from Parsons The New School of Design and an ADVANCED DIPLOMA in Online Education & Training from the Institute of Education, University of London.

Fabiana has experience in strategic planning, direct marketing, acquired in multinational and national companies such as WUNDERMAN. She has also 15 years of experience in specialized consultancy for cultural projects in incentive laws; both in the development and approval of customized projects, as well as in the management of sponsorship resources and accountability.

Since 2001 she has been a Partner – Director of KCE Consultoria Empresarial | b.k design; and is responsible for coordinating the FILE FESTIVAL platforms; FILE ALIVE and FILE ARCHIVE (online educational platform and archive Platform); as well as responsible for FILE cultural projects in incentive laws.

# ACM SIGGRAPH History Archives: Expanding the Vision through Teamwork

**Bonnie Mitchell; Jan Searleman**

Bowling Green State University, Clarkson University  
Bowling Green, OH, USA; La Jolla, CA USA  
bonniem@bgsu.edu; jetsza@gmail.com

## Abstract

The ACM SIGGRAPH History Archives is a team effort involving students, interns, volunteers, and computer graphic pioneers. In 2022, it expanded from an online archive to include a physical archive of SIGGRAPH publications and artifacts. These archives include information about presentations, exhibitions, screenings and events at the annual conference as well as information about SIGGRAPH communities and committees. With such a vast array of information, developing a robust infrastructure was essential. Team members researched, digitized and entered tens of thousands of entries and programmed innovative features that enable users easy access to this valuable resource. The SIGGRAPH History archive team is also preparing the archive to be part of the world-wide distributed network of new media art archives.

## Keywords

SIGGRAPH, online archive, computer graphics, interactive techniques, electronic art

## Introduction

ACM SIGGRAPH is an organization that has a long history of showcasing cross-disciplinary research, innovation and creative endeavors in the field of computer graphics and interactive techniques. The annual conferences began in 1974 and since that time their programming has expanded from technical paper presentations to include art exhibitions, emerging technology demonstrations, virtual reality experiences, animation screenings and much more. They have also produced hundreds of publications including art catalogs, animation videos/DVDs, proceedings, quarterly newsletters, etc. SIGGRAPH has a number of committees such as the Digital Arts Community, Education Committee, Pioneers, etc. as well as affiliated Chapters around the world that also produce content and host events throughout the year. With such a breadth of material to document and preserve, the job of creating an online archive for the organization was a daunting task. The project began as an extension of a previous project, the ACM SIGGRAPH Art Show Archive, spearheaded by Bonnie Mitchell and Jan Searleman and expanded to include all conference and organization materials in January 2021.

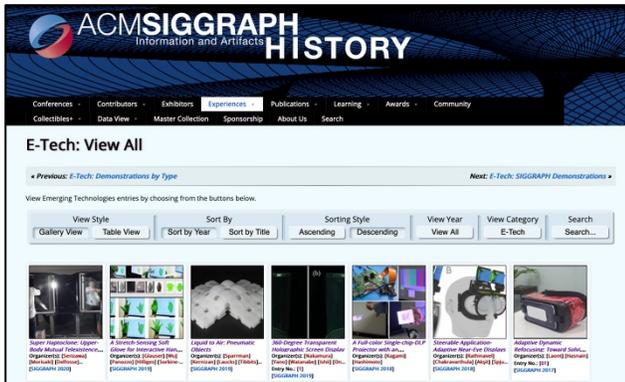
## Information Access

The goal of the ACM SIGGRAPH History Archive is to connect information related to conferences, contributors, events, publications, and the organization in a meaningful way. Before that could happen, access to the information dating back to 1972 was necessary. There has never been a physical location where all the SIGGRAPH materials were stored. Fortunately, Mitchell had her personal archive of SIGGRAPH materials to work with but it lacked materials produced before 1990 and was incomplete. SIGGRAPH community members provided information from their private collections but a lot of information was missing (and still is). To develop an online archive in a systematic way, having gaps in the information proved problematic and impeded the progress of entering data into our custom-built online archive system. In early 2022, the University of Waterloo had plans to renovate its computer graphics lab and wanted to donate all of its SIGGRAPH publications to our group. This collection, combined with Mitchell's materials and other donated items formed the start of the ACM SIGGRAPH Master Collection which is temporarily housed at Bowling Green State University, the host of the second SIGGRAPH conference in 1975.



## Teamwork

With access to a such a wealth of information, it was necessary to create a complex content management system that would be able to establish relationships between various types of data. Alexa Mahajan, a student at Bowling Green State University, created a sophisticated interface that enabled the user to access the information in gallery view or as a table, and sort it or filter it using a number of parameters. She also created menu systems and customized the fields, relationships and taxonomies to manage the data. All the selection icons were computer programmed using Processing by Alexa as well.



Lane and Liam Sykes along with Dayle Bennett, students at Bowling Green State University, worked on researching, gathering and entering data. Lane entered the SIGGRAPH courses and is now entering information about animations, a task started by Felix Bangert in the summer of 2021. Liam has worked exclusively with adding the Emerging Technologies demonstrations and Dayle enters information about panels and posters. The archive team also consists of two graphic design interns from the University of Guanajuato, Monserrat Meza Rico and Mariana Martínez Uribe, who designed the panel icons. SIGGRAPH also distributed swag at the annual conferences and Dan Pillis, a PhD student at MIT Media lab, does the imaging work to display these collectibles in the archive. Luis Wilson, originally an intern from the University of Guadalajara and now an employee at Microsoft, created import and export features to expediate the processing of data which sped up the data entry process. He reprogrammed the *Contributors* section and completely rewrote the back-end code to create the SIGGRAPH Plugin that we use in a WordPress environment to replace our distributed code fragments. These incredibly talented students, interns, and volunteers were directed by Bonnie Mitchell and Jan Searleman.

## Pioneers

Because the knowledge of the past does not rest solely in documents and artifacts, this project would not be what it is today if it were not for help from the Pioneers of Computer Graphics. Mary Whitton, the chair of the SIGGRAPH History committee has donated materials and knowledge and helps secure resources to continue our work. Pete Segal, original programmer of the AT&T Pixel Machines, helped with publications, early courses and researching our

scanning specifications. Maxine Brown and Dana Plepys, both from the University of Illinois, Electronic Visualization Lab, have been incredibly helpful by providing information about the early days and the history of animation at the conference, respectively. Many more pioneers (too many to mention here) have sent information, advice and this archive would not be where it is today without their help.

## Expanded Content

The ACM SIGGRAPH History Archive has been divided into a number of main menu categories: *Conferences*, *Contributors*, *Exhibitors*, *Experiences*, *Publications*, *Learning*, *Awards*, *Community*, *Collectibles* as well as information about the physical collection, etc. A category such as *Experiences* contains topics such as *Appy Hour* (App Development), *Art Show*, *Computer Animation*, *Emerging Technologies*, etc. Within each of those areas, the content can be viewed by *Year*, by *Conference* or by *Type* (VR, Haptics, etc.). This hierarchical branching of information enables the user to do broad or narrowly defined searches. Most of the content, but not all, is connected to a conference and a contributor and therefore appears on both the content's entry page as well as on the *Contributor* and *Conference* page. As the team uncovers additional content in the physical collection this structure expands.

## The Future

The ACM SIGGRAPH History archive is currently focused on researching, digitizing and entering data as well as building a robust system that will manage the relationships between the data and provide a meaningful experience for the user. At the same time, we are planning for the future as we move the content to a new virtual machine, develop the code to connect to other archives and build relationships with communities that have the knowledge we aim to embed in this expanded online archive.

## Authors Biographies

Bonnie Mitchell (Ohio, USA) is a professor of Digital Arts at Bowling Green State University and co-director of the SIGGRAPH History and ISEA Symposium online Archives. She is an organizer of the Summit on New Media Art Archiving and a member of the ISEA International Advisory Committee, SIGGRAPH History and Digital Arts Committees and SIGGRAPH 2023 History Chair.

Jan Searleman (California, USA) is a retired Computer Science Professor at Clarkson University and now serves as an adjunct research professor. Her research areas are VR, HCI, and AI. Jan is on the ACM SIGGRAPH Digital Art (DAC) and History Committee and co-organized the DAC Online Exhibition "The Earth, Our Home: Art, Technology and Critical Action". Jan co-directs the ACM SIGGRAPH History and ISEA Symposium Archive.

# MACBA Archive

**Marta Vega**

MACBA Museu d'Art Contemporani de Barcelona  
Barcelona, Spain  
mvega@macba.cat

## Abstract

The archive of the Museum of Contemporary Art of Barcelona (MACBA) aims to conserve the museum's documentary heritage and promote research into contemporary art. The archive preserves documentation of special historical value generated by MACBA and other individuals and organizations related to contemporary art practices. This document collection, built around the discursive lines of MACBA, is shown to the public through exhibitions and activities. The museum has developed the MACBA Digital Repository, an online archive, to preserve and disseminate the digital art and documentary collections.

## Keywords

Archives, Art museums, Contemporary art, Digital preservation, Digital repositories

## MACBA Archive

The archive of the Museum of Contemporary Art of Barcelona (MACBA) aims to conserve the documentary collections and promote research into contemporary art. The archive preserves documentation of special historical value generated by the MACBA and other individuals and organizations related to contemporary art practices as well as an extensive collection of artists' books. This document collection, built around the discursive lines of the MACBA, is shown to the public through exhibitions and activities and provides a reference source for contemporary art research.

Since its beginnings, the archive has faced the challenge of combining the care of the documents with the desire to facilitate their access to the public. This dual concern has led the MACBA Study Center to initiate a policy of digitization of the archival documents. On the other hand, the MACBA historical fund, which preserves the documents produced by the museum, was receiving more and more documents born in digital format. The need for a digital repository and a system for describing and managing digital files was also essential for the conservation of a significant number of works of art from the MACBA collection.

The museum has developed the MACBA Digital Repository [www.repositori.macba.cat](http://www.repositori.macba.cat) to respond to the need to manage digital collections, both digitized and born-digital. The MACBA Digital Repository is an online archive for preserving, managing, and disseminating MACBA's digital fonds, including photographs, audiovisual and sound recordings, graphic material and documents. This digital heritage is organized into two main groups: the Artistic Collection, which includes works from the art collection, and the Documentary Collection.

The MACBA Digital Repository was opened for public consultation in the museum library in 2017, after a design and technical development phase carried out by the museum team. Subsequently, remote access has been progressively available to the public.

The repository project has involved an in-depth analysis of the intellectual property rights and contractual conditions of the works and documents stored to determine the possibilities of making each material available to users. Depending on rights there are three main levels of consultation: internal for specialists in the treatment of the materials; access from the MACBA spaces, and open to consultation from any place for any user. Access to the collection is also being progressively integrated into the MACBA website [www.macba.cat](http://www.macba.cat) with the aim of making the museum collections increasingly more widely known.

## Author Biography

Marta M. Vega is head of the MACBA archive and library. She holds degrees in Art history and Documentation from the University of Barcelona. Her previous experience in libraries includes the Biblioteca de Catalunya and the Museu Nacional d'Art de Catalunya. She co-authored the e-pub on museum archives *Folding the exhibition*, MeLa Project, 2014.

# Introducing Arc-hive

*Antonio Gagliano, Luciana Della Villa*

Affiliation: HANGAR

Location, Country: BARCELONA, SPAIN

Emails: [antonio@hangar.org](mailto:antonio@hangar.org), [luciana@hangar.org](mailto:luciana@hangar.org)

## Abstract

'Introducing Arc-hive' is a 10 minutes presentation by Antonio Gagliano and Luciana Della Villa that proposes to introduce Arc-hive's framework, its fundamental objectives and challenges, and to open up the collective research process carried out so far.

## Keywords

platform, artworks, specimens, living materials, free software, open data, best practices, case study, open resources, infrastructural maintenance.

## Introduction

Project Arc-hive creates an open source digital platform that aggregates, preserves, publishes, distributes and contextualizes a variety of information, knowledge and documentation on art with a focus on biomedica, ensuring open access to a variety of users, and a wide outreach of digital materials across cultural sectors and territories. Arc-hive addresses the challenges of creating and distributing cohesive digitization and dissemination protocols through a centralized digital space where knowledge and best practices relevant to art predominantly using biological materials are collected. Created in collaboration with six partners working in NGO and museum sectors, publishing, IT and audiovisual fields, the platform functions as a catalyst for the activities of artwork and museum specimen digitization, archiving and distribution; remote event participation, planning and realization; augmented publishing; staff and student education and training; and topic contextualization and interconnection. Aimed at building capacities of various cultural agents working with biological and living materials, the project provides a feasible and tailored digital solution to some issues fundamental to the field, following philosophical principles of open data and information sharing throughout all project phases.

The presentation proposes to introduce Arc-hive's framework, its fundamental objectives and challenges, and to open up the collective research process carried out so far. Archival practices have rarely explored how to cohesively build-up and maintain open source digital infrastructures to host cultural objects that, by the very living nature of their components, are elusive and difficult to be digitally captured. The uninterrupted life cycles of mutation, degradation and regeneration of artworks predominantly based on biological materials open up several questions around digitization and cataloging practices and protocols. Where, for example, does the most important part of an artwork focused on living materials reside? Is it possible to locate and migrate it in such a way that it can inhabit the digital field without becoming permanently distorted? Should we capture all the stages of its life cycle? The beginning and the end, or just one of its phases? Should we correct or absorb the extraneous elements that emerge during the process of digitization? Should we assume that the utterly abstract, generic, mathematical space of digital three-dimensionality always brings with it the obliteration of its specific surroundings?

Even though many of these questions are also relevant to the digitizing and cataloging of other fields such as dance or performance (that are elusive to the archive because they are also based on living and dynamic media), the infrastructures for hosting works based on biomaterials underline in a special way the question of maintenance and care. It is problematic to define what kind of close ties needs to be assumed to keep physical metabolic artworks alive, to understand how to lend them to other institutions, how to transport them and catalog them, how to acquire them and integrate them into museographic collections, and the development of a digital platform doesn't solve all those issues but rather reinforce them. Digital does not make it easier. One of the conceptual forces driving Arc-hive is to reflect and explore how digitized living materials could be hosted on a network of federated

servers that ultimately seeks to generate an ecosystem of open source data and code. A cornerstone metaphor of the project's major challenge is contained in the project logo: the division of the word 'archive' into two elements, mimicking the cellular phenomenon of mitosis, metaphorically connects the biological replication process of a single cell with the endless replicating capacity of free code. Thus, when we refer to living matter and ecosystems we are not only talking about networks of life within the pieces itself, nor a vibrant community of specialized readers, but also to a multi-dimensional community of researchers, editors and open source developers who will continue taking care of the infrastructural levels of the platform, generating new iterations of the code, getting behind the content and expanding the tools and features we've already created.

What performative effects do artworks focused on living materials produce on hard structures of knowledge, such as the collection or the archive? What can archival practices learn from engaging with digitized artworks focused on living materials? The encounters between the political background of open source communities and the specialized field of artistic practices working predominantly with biomedial opens up an infinite space of thought and conceptual articulations. These are, in any case, forms of institutional research that acquire existence in practice, as happens with artistic research in general. They exist as knowledge because they are made in the making, and in alliance with the materials rather than before. It is almost impossible to think how diverse digital objects and heterogeneous collections can fluidly coexist within a platform before thinking about what open source web design allows us to do. Establishing a set of curatorial criteria that organizes the admittance of content to the platform invites not only to craft editorial statements but also to imagine administration roles and design a sustainable and accessible UX for platform contributors. It is in the reciprocal entanglement of discussion and technique applied to materials that a deeper understanding of how to take care of living things is finally produced.

## Biographies

**Luciana Della Villa** has a degree in Art History from the University of Barcelona and a master's degree in Cultural Heritage Management from the same center. She was part of the Art Department and the Communication Department of the Vila Casas Foundation, both at the Can Framis Museum and the Espacio Volart. At the same time, she develops his personal project Svper linked to music, and works on musical creation for advertising. Since 2017, she coordinates the Communication area of Hangar.

**Antonio Gagliano** is a researcher and artist. His projects intertwine practices around structural imagination to explore the multiple ways in which knowledge emerges, is organized and distributed. He has participated in exhibitions such as *La tradició que ens travessa* (Arts Santa Mònica, 2022), *Acció. Una història provisional dels 90s* (MACBA, 2020) or *Manufactories of Caring Space-Time* (Museum voor Schone Kunsten, 2017). He has contributed to newspapers such as *Der Spiegel*, *Süddeutsche Zeitung* and *La Vanguardia*, and books such as *Pornotopia. An Essay on Playboy's Architecture and Biopolitics* (Paul B. Preciado, MIT Press, 2014). For the last decade, he has contributed as editor and sound producer at Son[i]a de Radio Web MACBA and has been a regular contributor to the museum's educational programs. Since 2020, he coordinates the Research and transference of knowledge area of Hangar.

# The Computer Arts Society Archive

## Sean Clark & Sean Carroll

The Computer Arts Archive, Leicester, UK

[www.computer-arts-archive.com](http://www.computer-arts-archive.com)

[seanc@interactdigitalarts.uk](mailto:seanc@interactdigitalarts.uk), [seanzshow@gmail.com](mailto:seanzshow@gmail.com)

### Abstract

The Computer Arts Archive is a not-for-profit company that collects, exhibits and promotes computer arts for the benefit of artists, audiences, curators, educators and researchers. We collaborate with other collections, museums and galleries to explore the impact of digital culture and ensure that computer art is recognised as a significant contemporary art form with a rich and diverse history. In particular, we work closely with the Computer Arts Society, a member-based organization founded in 1968.

### Keywords

computer art, digital art, media art, histories, archiving

### The CAS50 Collection

The Computer Arts Society was established in London in 1968 as a forum for people interested in the use of computers in the creative arts. It organizes meetings and events, hosts exhibitions and publishes its own occasional journal, PAGE.

In 2018 the society put together an exhibition of 2D digital artworks to help celebrate the fiftieth anniversary of the founding of the society. The resulting “CAS50 Collection” featured multiple artworks by 24 significant artists and was exhibited in Leicester and Brighton in the UK, and then as part of “Event Two” at the Royal College of Art and “The Digital Design Weekend” at the V&A, both in London.

### The Computer Arts Archive CIC

In order to provide a physical home for the CAS50 Collection, and to create a base from which further collecting could take place, a new non-profit company, the “Computer Arts Archive CIC” was established in 2019 and an office opened in Leicester in the heart of the UK

### Other Collections

Despite delays caused by the global COVID-19 pandemic, the Computer Arts Archive has managed to grow its collections over the past two years

We are now custodian of the Electronic and Visualization and the Arts (EVA) conference archive, containing 30 years of material, and the Edward Ihnatowicz Archive. We also have a collection of computer artworks made in the 1980s, plus Sean Clark’s personal collection of “cyberculture” materials from the 1990s.

Our goal is not to attempt to build a “definitive” collection of computer art from the last 50 years, but to focus on previously untold stories within the history of computer arts and to share our work with other archives and collections.

### Current Challenges

The Computer Arts Archive is still relatively new. As well as the usual challenges of such a project – obtaining funding and storage space – our key task as present is to index the materials in the archive in a way that will make the data interchangeable with other projects. We are particularly interested in working with other archives to use and develop common metadata standards for data representation, as well as identifying open source archiving software for data storage.

We are also working with De Montfort University in Leicester to investigate how technologies such as Machine Learning and Artificial Intelligence can be used to uncover connections between the materials within the archive.

# Global Archiving Network: A Case Study at the Second Summit on New Media Art Archiving at ISEA2022

**Terry C. W. Wong**

ISEA Archives, Simon Fraser University  
Vancouver, CA  
[terrywong.cw@gmail.com](mailto:terrywong.cw@gmail.com)

## Abstract

One of the primary functions of an archive is to act as a repository to store essential documents and records throughout history; consequently, these stored archival materials can help us re-imagine a collective memory of the past. With rapid changes in the dissemination of information in recent years, the conventional ways of archiving may not be able to capture all the essential records of our time. This is especially concerning in regard to new media art archiving. Many recently created important new media artworks have been disappearing without being archived. If this issue is not addressed, we may lose a significant part of our digital cultural heritage. To respond to the issue, archives worldwide have attempted to approach the problem collectively. This lightning talk discusses a case study that will be conducted in response to the Second Summit on New Media Art Archiving at ISEA2022.

## Keywords

archive; new media art; digital culture heritage, global archiving network; Liverpool Declaration; ISEA; ISEA Archives

## Introduction

New media art is a contemporary-art category in which the media itself is very technology-dependent. Artists often incorporate emerging technologies in their artworks and constantly redefine the category. Unlike many other more static traditional art media, this evolving genre of art faces a severe problem: many recently created artworks can no longer be exhibited and may disappear without a trace due to technology obsolescence, lack of data, and insufficient documentation. New media art archives around the globe have been facing this challenge independently in the past. As technology changes, the challenge in archiving new media artworks has become more critical. Therefore, an initiative to establish global collaboration between new media art archives was initiated with the publication of the Liverpool Declaration. [1] The Declaration has outlined two main goals: 1) Establish international and sustainable funding structures and 2) Support an international association/institution for shared data. Additionally, it suggested an action agenda for the alliance to promote collaborations. [1]

Since then, major new media art archives around the globe (ISEA, SIGGRAPH, FILE, ADA, and Ars

Electronica) have had group discussions, implementation meetings, and have done presentations at various conferences in an effort to develop an international research-archive infrastructure. An important conference dealing with this topic is the Second Summit on New Media Art Archiving at ISEA2022. The First Summit took place at the ISEA2020 symposium held online and hosted in Montreal, Canada. [2] After the success of the First Summit, the Second Summit was co-organized by the ISEA Symposium Archives and the SIGGRAPH History Archives and in cooperation with ISEA2022 Barcelona, the Barcelona Museum of Contemporary Art (MACBA), the Electronic Language International Festival (FILE) Archive, the Archive of Digital Art (ADA) and the Ars Electronica Archive. [3] The Summit series is an effort to establish a global archiving network as defined in the Declaration. These events allow different stakeholders to exchange ideas related to new media art archiving and lead to collaborative archiving protocols and strategy development. This makes the summit ideal for conducting a case study for the emerging global archiving network research. The goals of the case study are: 1) to identify the current status of the emerging archiving network, 2) to analyze the various problems and solutions, and 3) to report the findings back to the archiving community as a contribution. The case study consists of data collection mainly through observations, literature reviews, surveys, and interviews.

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- [3] "Second Summit on New Media Art Archiving at ISEA2022," ISEA Symposium Archives, accessed April 17, 2022, <https://isea-archives.siggraph.org/second-summit-on-new-media-art-archiving-at-isea2022/>.

# Interconnecting Archives: Paving a Path Forward

**Moderator: Bonnie Mitchell\***

**Presenters: Alexa Mahajan\*, Luis Wilson^, Dalton Lopes Martins+**

ISEA/SIGGRAPH Archives/Bowling Green State University\*; SIGGRAPH Archives/Microsoft^; Tainacan/University of Brasilia+  
Ohio, United States\*; Ciudad, Obregón, Sonora, Mexico^; Brasília, Brasil+  
bonniem@bgsu.edu; amahaja@bgsu.edu; luisfwilson1998@gmail.com; dmartins@gmail.com

## Abstract

The concept of connecting information from various repositories of information has been around for quite a while, yet most online new media art archives exist independently without direct connections to each other. Programmers working on the ISEA, SIGGRAPH and FILE online archives have been collaboratively developing a system to link information about the people and art events documented in their respective archives to each other. This initiative will extend to include the Archive of Digital Art and Ars Electronica archives, as well as other archives, once the prototype is completed. This panel will discuss the challenging process of developing interfaces, building APIs, and working with wikidata as well as the process of analyzing, sanitizing, authenticating and modifying databases containing information about people and new media art events.

## Keywords

archiving, connection between archives, database sanitization, wikidata, name authentication

## Introduction

The idea of a global interconnected network of repositories of knowledge dates back to Paul Otlet's quest for a substitute for the book in the late 1800s<sup>1</sup> and more recently to Ted Nelson's Project Xanadu in the 1960s<sup>2</sup>. The development of the World Wide Web, begun in 1989 and publicly released in 1993<sup>3</sup> implemented Nelson's concept of Hypermedia<sup>4</sup> using the internet as a means of transmission thus furthering the goal of creating a global network of interconnected knowledge. Archives, both web-based and physical, represent pockets of focused information on specific topics, genres, or events. Physical archives, because of their dependence on locality and spatiality, are nearly impossible to connect to one another without the addition of digitization and the establishment of a complementary digital archive. Because information exchange and artifacts in the 21<sup>st</sup> century are increasingly digital, archivists who work with new media art, often opt to document physical artifacts and include copies of digital

assets in electronic archives. If publicly available via the web, these archives offer immense opportunities to realize Nelson's concept of "the universal, democratic hypertext library that would help human life evolve into an entirely new form." The challenge though is in the implementation of establishing a connection between these online archives. This panel will discuss goals, first steps and implementation procedures conducted over the past year between the ACM SIGGRAPH History Archives<sup>5</sup>, ISEA Symposium Archives<sup>6</sup> and the FILE (Electronic Language International Festival) Archives<sup>7</sup>.

## History

The call to action to connect new media art archives began with the Liverpool Declaration<sup>8</sup> (Media Art Needs Global Networked Organisation & Support) which was signed by nearly 600 professionals in the field of new media art. The Declaration's second goal was "Supporting an International Association/Institution for Shared Data." In 2019, Wim van der Plas, co-founder of ISEA, and Oliver Grau co-moderated a roundtable discussion at ISEA2019 and it became apparent that the time was right to begin the planning and implementation of an interconnected network of new media art archives. Representatives from ISEA, SIGGRAPH, Ars Electronica<sup>9</sup> and the Archive of Digital Art<sup>10</sup>, met periodically over the course of 2 years to discuss strategies and outline challenges. In 2020, the first Summit on New Media Art Archiving was organized by representatives of the ISEA, SIGGRAPH, ADA and Ars Electronica archives and held online during the ISEA2020 symposium. Representatives from the FILE Festival archives contacted the ISEA and SIGGRAPH archive directors after the Summit expressing their desire to be involved with this initiative and invited ISEA and SIGGRAPH archive representatives to give a talk at the FILEAlive<sup>11</sup> online meetings. This relationship with the representatives of the FILE Festival initiated the implementation phase of the project to connect new media art archives globally.

## Central Repository and Authentication

The SIGGRAPH, ISEA, and FILE archive team met with Dalton Martins, coordinator of the Tainacan<sup>12</sup> project at the University of Brasilia, to discuss the development of the new FILE archive. While working on taxonomies, relationships between data, and information architecture, the team also began the implementation of the complex infrastructure to connect the archives. Dalton Martins led the discussion of the technical requirements of the project<sup>13</sup> with his vast knowledge of how to use wikidata<sup>14</sup> as a central repository for information as well as a unique identifier for people. Plans were made to connect people's profile pages located in the three archives to each other using wikidata as the central repository for the structured data related to a person's identity. This method of authentication was chosen because it is an open source knowledge database accessible to all archives free of charge and most likely to resist obsolescence. The challenge was preparing the data for the process of uploading the basic information related to people (name and affiliation) in the archives to wikidata.

## Establishing the Connection

Alexa Mahajan, a programmer for the ACM SIGGRAPH History Archives, began the implementation procedure by designing a means for the connection data to be input into the archive system and displayed on the front-end of the site. When a person has an entry in another archive, the appropriate archive icon appears on their profile page and this icon links to the corresponding webpage within that other archive.

ACM SIGGRAPH  
Information and Artifacts HISTORY

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### Matthew Kenyon

Most Recent Affiliation(s):  
Pennsylvania State University and SUNY Fredonia

Artwork(s):  
  
Improvised Empathetic Device  
[Matthew Kenyon] [SIGGRAPH 2007]

Experience(s):  
  
Type: [E-Tech]  
Spore 1.1  
Organizer(s): [Easterly] [Kenyon]  
Entry No.: [18] [SIGGRAPH 2005]

Role(s):  
Art Show Artist  
Emerging Technologies Presenter

Matthew Kenyon can also be found in the following archives:

ISEA ARCHIVES FILE ELECTRONIC LANGUAGE INTERNATIONAL FESTIVAL ADA  
National Digital Art Forum presented by central.net

Connections between archives established

The goal was to establish a bi-directional link between archives without having to enter each connection manually.

She designed the system to automatically establish the links to other archives by dynamically populating the data fields. As we tested this procedure, it became apparent that each archive's database of "people" information would need to be carefully scrutinized to ensure that a person was not entered twice into the archive. Because of the use of nicknames and various other ways of listing one's name, complicated by the fact that females often change their names through marriage, we needed to identify all entries in the database that referred to a single individual by different names and consolidate those entries. With over 10,000 names in the SIGGRAPH archive and nearly 8,000 in the ISEA archive, ensuring there were no duplicate listings was a challenging task.

## Name Comparison Code

The back-end programmer for the SIGGRAPH archives, Luis Wilson, developed code to compare names from one archive's database to another archive's database to see if any names in the two archives matched. With the goal of distributing an application to the partners involved in the project, Alexa Mahajan developed the front-end interface using Python. This interface allows the user to select two databases and run a comparison between their exports, enabling the list of "people" names in their own archive to be compared with the exported list of "people" names in another archive. This non-trivial code uses fuzzy logic, based on Dalton Martins' advice, to compute the percentage of likelihood that a match exists between two names. In running the application to compare the SIGGRAPH names to the ISEA names, it became apparent that there were many instances of the same individuals being entered repeatedly into the system using a variety of different naming conventions (with or without nicknames, middle names, married names, etc.). We realized that we could use the same application to compare the ISEA archive to itself and the code would identify these duplicate and related names. Using the results of this code, we determined that if an entry received an 85% chance of a match (or above) with another name in the database, we needed to take a closer look to determine if it truly matched. Even when the system ranked the match as 100%, we still needed to manually ensure the two entries in question were, in fact, the same person (to account for cases where distinct individuals share the same name).

## Data Export

Since the SIGGRAPH, ISEA, and FILE archives are still in development, this need to compare each archive's list of names mandated that we also program a means of exporting the data we needed. Although the information architecture is similar between the three archives, the differences posed unforeseen challenges. The SIGGRAPH archive was in the process of being moved to a virtual machine and the export of data was only possible with an older cloned version of the archive. In addition, both the SIGGRAPH and ISEA archives treated artist collectives

and companies differently than the FILE archive. This discrepancy posed challenges in comparing the data exports, and so Alexa reprogrammed the way that SIGGRAPH and ISEA handle these entities within their databases. Implementing this change required us to go through the 18,000 entries and move all artist collectives and companies from the “people” table to the “collectives/groups” table.

## Next Steps

After sanitizing our data to ensure the list of “people” names did not contain duplicates and that a similar export structure was maintained between archives, the next step was to use OpenRefine to further cleanse the data and compare it to existing wikidata “people” entries. This is the current state of the process. The database preparation enables us to upload the basic information about a person from each of the archives into wikidata and input the link to the new media art archive page that contains a profile of that person. After we have populated wikidata with this information, we will write code to check this repository to see if an entry in our archive exists in wikidata and then populate the fields in our archives to establish the connection to other archives. This entire procedure will then be utilized to connect art event entries in each of the archives since many artworks, animations and performances often are documented in each of our individual archives. We will then make the applications we developed publicly available for new media art archives to create direct data connections to other new media art archives around the world.

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## Authors Biographies

Bonnie Mitchell is a digital artist, animator, and archivist, as well as a professor at Bowling Green State University in Digital Arts, Ohio, USA. Mitchell is the co-director of the SIGGRAPH History and ISEA Symposium online Archives and also is a member of the organizing team of the Summit on New Media Art Archiving (first held in 2021 online and again in 2022 in Barcelona). She is also a member of the ISEA International Advisory Committee, the ACM SIGGRAPH History, and the Digital Arts Committees. In 2023, Mitchell is in charge of the celebration of the 50th SIGGRAPH conference in Los Angeles.

Alexa Mahajan is a senior at Bowling Green State University, majoring in digital arts and minoring in computer science and math. She is interning at Pixar Animation Studios in the Pixar Undergraduate Program for technical direction, summer of 2022. Mahajan also works as a programmer for the SIGGRAPH History Archives, focusing on user interface development and content organization. She aspires to work as a technical director and get to combine her passion for animation and programming to develop tools that help others create with excellence.

Luis Wilson obtained a bachelor's degree in Computer Science from the Monterrey Institute of Technology and Higher Education in Mexico in 2021. Currently he is a software engineer at Microsoft working in web development, his main area of interest. Since 2020, he has been a volunteer programmer for the SIGGRAPH History Archive, helping the site grow and reach its potential. He is also involved in the archive's mission of creating interconnected data between new media art archives by creating tools that aid in establishing the relationship of data coming from different sources.

Dalton Martins is a professor in the Faculty of Information Science (FCI) at the University of Brasília and works with research on the interface between computer science and information science. He focuses specifically on data science and websemantics/open data linked applications for digital collections development and data analysis of memory institutions' collections. He currently coordinates the Tainacan project, in partnership with the Brazilian Institute of Museums.

**Second Summit on  
New Media Art Archiving**

**ISEA2022 Barcelona  
10-16 June 2022**

# **-Long Papers-**

# A forgotten, almost lost, and partially hidden piece of history: new media arts in Latin America

**Ricardo Dal Farra**

Concordia University / CEIARTE-UNTREF  
Montreal, Canada / Buenos Aires, Argentina  
ricardo.dalfarra@concordia.ca

## **Abstract**

Who tells history? We can find multiple versions of the new media art history, most of them with subtle differences. Still, until a few years ago, it has been unusual to find references pointing to countries out of a small group from Europe and North America. Several projects have been developed to change that situation. UNESCO's Digi-Arts project, and the Latin American Electroacoustic Music Collection, hosted by The Daniel Langlois Foundation for Art, Science and Technology, are examples of the relevant role and the impact that the preservation and documentation of electronic artworks, together with its public access, can play in having another perspective on our recent history.

## **Keywords**

Latin America; new media art preservation; electroacoustic music history; sound art; cultural decentralization; postcolonialism.

## **Introduction**

The journey from the cultural memory and the ethical concerns to the practical strategies on preservation and the impact of disseminating knowledge generated by new media art has been navigating a sinuous road.

Memory's death could benefit some as much as the desire for immortality could block the way to innovation open naturally to new generations. New media art memory has been partially dead, or perhaps deaf or blind or simply looking to the other side, maybe to avoid the perception that the so-called digital revolution has reached most of the known world and that history does not happen only in a few "central" countries. The desire for immortality and for being a cultural lighthouse as much as the guardian of the "right" values and the significant art should not take us all to mislead that intelligence and sensibility belong to a few.

Who tells history? Who knows about it or who has the opportunity to do it? We can find multiple versions about the new media art history, most of them with subtle differences, but it has been unusual -until recently- to find references pointing to countries out of a small group from Europe and North America. Inequalities have always

existed, and if we want to see a change, we will probably need to work hard ourselves to produce new results. Many stories about new media art were lost or are hidden and probably should be part of the official history and not just left aside. There have been people, ideas and concepts, artworks, discoveries and inventions, and we expect someone will take care of keeping the memory of all that for us, but sometimes it simply does not happen, and when we look around after a while, it seems that the history has not been the one we thought it was and we remember, but a different one that is being told by others.

Between the obsession for archiving everything and the difficulty and strong responsibility of deciding what to preserve, the opportunity to archive new media art makes us face a challenge involving technical, political, social, cultural, and economic aspects.

How many histories can be told about the same subject? To whom is their narrative directed? I have heard some educated young people saying that "if something is not on the Internet, it does not exist." Then, today the digital divide could be not linked to who has access to the web but to who dominates the inclusion of content or develop the strategies to keep our attention on certain places and not others. It looks like we are flooded with cues guiding us to consider that the art conceived by some cultures is the only one to be recognized as valid.

Several projects have been developed to change this situation regarding the history of new media art: UNESCO's DigiArts project was a major initiative "aiming at the development of interdisciplinary activities in research, creativity and communication in the field of media arts." [1]

The Daniel Langlois Foundation for Art, Science and Technology in Montreal has been a leading organization heavily focused on studying theoretical aspects related to preserving new media art and actually archiving it. Several meaningful projects have been developed or hosted there since the late 90s, including the Steina and Woody Vasulka Fonds, the 9 Evenings: Theatre and Engineering Fonds, the Collection of Documents Published by E.A.T. and the Latin American Electroacoustic Music Collection, among many others. [2]

## UNESCO's Digi-Arts project

According to UNESCO's online portal: "DigiArts is a reference website on art, science and technology and more particularly on media arts and electronic music. It resulted from a period of 6 years (2002-2007) activity undertaken by a team of interdisciplinary professionals working in different UNESCO programmes (culture, communication, science, education, etc.) based in various parts of the world, in conjunction with a range of outstanding national and international experts."

It also explains: "The portal contents could be categorized in four major chapters: 1. Information on the history of media art and electronic music as well as a collection of pioneer artists' bios, coming mostly from Asia, Africa, Arab States and Latin America (Media art and Music using technology); 2. A network of specialized institutions dealing with research, training, creativity and promotion of digital art and music, classified by geo-cultural regions (Regional networking); 3. Articles, essays, course contents in different fields related to Digital creativity, open-source software tutorials, as well as other teaching material (Training); and 4. Professional and non-professional digital productions by young people (UNESCO Digital Arts Award and Young Digital Creators)."

Adding that, they take the opportunity to thank all "...partners warmly for their support and cooperation in achieving the main objective of the DigiArts project: to promote North-South collaboration and share information and knowledge on the use of new technology in the artistic field." Closing with "Enjoy your visit to DigiArts." Worth mentioning here that all the relevant information has not been updated since 2008, and the portal, including a massive knowledge gathering on new media art history, is almost non-functioning today and is very hard to find. This major international cooperative effort led by UNESCO was abandoned, and no interest or resources were later invested in it.

DigiArts goals were: (a) Disseminate historical, theoretical, artistic, technical and scientific research in the field of electronic and digital arts, including interdisciplinarity study of the arts and the sciences; (b) Promote information exchange, dialogue and communication among artists, scientists and technicians from different geo-cultural regions, especially enabling developing countries to develop their own approaches and practices in various disciplines and fields of knowledge connected to media arts; (c) Support existing institutions and networks throughout the world in the transfer of knowledge; and (d) Encourage the use of electronic software among the youth for electronic communication and creation. [3]

Four international advisory groups and partners provided overall policy guidance on different areas: the Virtual Library International Advisory Committee; the Art, Science and Technology International Advisory Committee; the

Media Arts History International Advisory Committee; and the Electronic Music International Advisory Committee.

One of the first writings commissioned by DigiArts was the research report *Historical aspects of Electroacoustic Music in Latin America: From the Pioneering to the Present Days*. With over 75,000 words, this text was the result of an extensive investigation led by Ricardo Dal Farra focusing on the history of electroacoustic music in Latin America. [4]

After the original report in English was published in the UNESCO portal, a second version, not translating by complementing the previous text, was also written by Dal Farra: *La música electroacústica en América Latina*. [5]



Figure 1. The CLAEM Electronic Music Laboratory, 1964.

Those texts included information on the electronic works of at least 191 artists and composers from Argentina, 14 from Bolivia, 90 from Brazil, 39 from Chile, 39 from Colombia, 5 from Costa Rica, 44 from Cuba, 3 from Dominican Republic, 11 from Ecuador, 5 from El Salvador, 6 from Guatemala, 73 from Mexico, 3 from Panama, 4 from Paraguay, 15 from Peru, 12 from Puerto Rico, 27 from Uruguay, and 27 from Uruguay. 44 from Cuba, 3 from the Dominican Republic, 11 from Ecuador, 5 from El Salvador, 6 from Guatemala, 73 from Mexico, 3 from Panama, 4 from Paraguay, 15 from Peru, 12 from Puerto Rico, 27 from Uruguay, and 35 from Venezuela.

In addition to information on the works and their creators, these texts included references to unique projects and centres in various countries of the region (e.g., Centro Latinoamericano de Altos Estudios Musicales - CLAEM of the Instituto Torcuato Di Tella, which was, in the 1960s, a critical place for the development of new media art in Latin America). And it also noted some pioneering developments around new technologies applied to the creation of electronic art (e.g., Juan Blanco's work in Cuba, Raúl Pavón in Mexico, Fernando von Reichenbach in Argentina, among others).

DigiArts main Line of Action were: (a) Knowledge and Research: History and aesthetics of artistic, scientific and

technical movements relating to digital and electronic arts; (b) Publication and Information: Virtual library on the electronic arts; (c) Training and Capacity Building: Best practices and directory of creative digital tools; (d) Networking and Partnerships: Creation of a space for interdisciplinary research and experimentation; and (e) The "Young digital Creators" project. [6]

All this is now part of obscurity. Then, we continue to reinvent the wheel, telling new stories and allowing certain facts to be lost while others emerge seeming to be the ones who have led the development of the electronic arts in the world. However, this is not always the truth. It is only part of history.

## Latin American Electroacoustic Music Collection

Unavailability of musical recordings, bibliography and almost any basic reference to the many electroacoustic music activities that were developed since the early 1950s in several Latin American countries was commonplace in the 1970s. That situation did not change much during the following decades.

In various Latin American countries, universities, state organizations and major private foundations have taken initiatives to support art research and the use of new media already in the early 1960s. Nevertheless, most projects have stopped before developing the resources to document their processes and preserve the results. Many early artworks, for example, have been lost or damaged.

The Latin American Electroacoustic Music Collection has over 1,700 digital recordings of compositions by almost 400 composers. It is also accompanied by a trilingual historical essay, and over 200,000 words in its database. [7] [8]

This Collection is an example of the relevant role that the archival of artworks and its public access can play in having another perspective about history. It is today an essential resource in the field, being consulted extensively by people from around the world (e.g., new media art researchers, historians and artists, composers, performers, musicologists, and the general public) and is helping to transform the usual perception of "ownership" that exists related to some countries with respect to the new media art history.

The Latin American Collection includes compositions for fixed media (tape, DAT, CD, HD or similar) and mixed works for acoustic instruments or voices and fixed media or live electronics/interactive systems. There are also multimedia works in the database. In the case of pieces for fixed media and other sound sources (e.g., mixed works), complete recordings as well as "tape only" parts (e.g., fixed media) are preserved and catalogued. The database also includes audio and audiovisual recordings of interviews to composers and technical innovators (e.g., Alberto Villalpando from Bolivia, Manuel Enriquez from Mexico,

Alfredo del Mónaco from Venezuela) as well as photographs, videos and some scores (e.g., by Alcides Lanza from Argentina, Javier Alvarez from Mexico, Milton Estevez from Ecuador). [9] [10]

From a technical perspective, the archiving of audio material went through a myriad of problems: recovering from massive hard disk crashes, finding analog tape recorders with old track formats, re-digitizing material to correct severe DC offsets in brand-new equipment, computer operating systems conflicts, etc. Defining how to work with very noisy old recordings was another challenge (some pieces were processed using an advanced de-noise system to reduce hiss, always preserving the original recording and following the composer's advice whenever was possible). The bulk of the process was done between 2003 and 2005 at The Daniel Langlois Foundation offices, working with three different computers and nine hard disks to manage the audio and visual files, the database and huge amount of information, and the daily international communications.

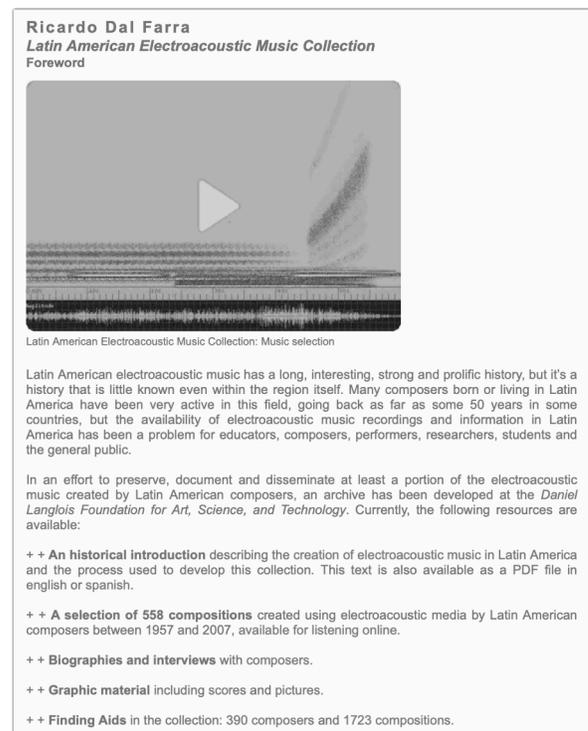


Figure 2. The Latin American Electroacoustic Music Collection, hosted by The Daniel Langlois Foundation.

Worth mentioning that while the recording quality of some music stored on old analog tapes could have suffered through the years, digital technologies for recording storage were the ones presenting the most difficult challenges. For example, some DATs (Digital Audio Tapes) lost part of the

recordings, and only a loud digital noise was in place of the music. In those cases, the problem was not only a poor quality (e.g., because of hiss or the loss of high frequencies) but a complete lack of the recorded signal, without any possibility to recover the original material.



Figure 3. Analog Graphic Converter, developed by Fernando von Reichenbach at CLAEM, in Argentina, during the late 1960s.

There are 1,723 electroacoustic pieces preserved as digital audio -with CD quality- in the database. While all works are available for listening to researchers who ask for an access code (to avoid copyright infringement) contacting the Langlois Foundation, 558 works from those compositions are freely available and can be listened to by the general public online. There are multiple ways of finding the information and resources in the database. The digital audio recording of a composition can be found by its title, the name of the composer, the country linked to that composer, the year or decade when the work was composed, etc. In addition, there are two playlists to access and listen to the compositions: one sorted alphabetically by the last name of the composer, the other sorted chronologically, following the year the piece was composed. [11] [12]

Instrumentation, program notes, production studio, version, composer's bio and more have also been included for each work when the information was available. Part of that comes from the two reports commissioned by UNESCO, previously mentioned.

The Latin American Electroacoustic Music Collection is one of the most visited and consulted collections of the Daniel Langlois Foundation.

## Final Words

The UNESCO project, and later the Latin American Electroacoustic Music Collection, have recovered and made visible (and listenable) the creative work of many artists otherwise almost forgotten. They have defied the wish of immortality and the hegemony of the electronic art history narrative, breaking one of the memory's death roads and slowly shifting and widening the way the history of electronic art is being understood.

Those projects cannot fade away. They need to be supported and disseminated the information. A permanent circle of forgetting part of our history will not help us grow and improve as a society.

DigiArts and the Collection are only part of the history of new media art in Latin America. There is so much more to tell and spread: Not only in artistic creation and applied technological development but also in education, there were pioneering programmes that have intertwined art, science and technology in countries such as Argentina, starting decades ago.

We, humans, need to learn better ways to live together, and art and memory are key factors to that end.

Archiving and disseminating electronic and new media art history findings is crucial to comprehending the present and building our future.

## Acknowledgements

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## Author Biography

Dr. Dal Farra is professor of music and electronic arts at Concordia University, Canada, and director of the electronic arts center CEIARTE-UNTREF, Argentina. He is the founder of the international symposia Balance-Unbalance (BunB) and Understanding Visual Music (UVM). Dal Farra has been director of Hexagram in Canada, coordinator of the Multimedia Communication national program of the Federal Ministry of Education in Argentina, senior consultant of the Amauta New Media Art Centre of Cusco in Peru, and researcher of UNESCO, France, for its project Digi-Arts. He designed university programs on art-science. Ricardo created the Latin American Electroacoustic Music Collection. He is a board member of ISEA International, and a member of several editorial boards: Leonardo/ISAST (MIT Press, USA), Organised Sound (Cambridge University Press, UK), and Artnodes (UOC, Spain), among others. Dal Farra is a composer/artist specialized in transdisciplinary actions with science and emergent technologies.

<https://www.concordia.ca/faculty/ricardo-dal-farra.html>

<https://www.facebook.com/UVMvisualmusic>

<https://www.facebook.com/balanceunbalance>

# “Always Only Once:” The paradox of preserving performative digital works

Amy Alexander

University of California, San Diego  
La Jolla, California, USA  
ajalexander@ucsd.edu

## Abstract

The 20th century saw various approaches to expanded cinema performance, including color organs and mixed media “psychedelic” light shows. These practices were difficult to document technically and were, to various extents, based on performance in the moment. Technically, archival 20th century visual performance documentation and preservation ranges from the non-existent to the surprisingly future proofed. But expanded cinema historian William Moritz summed up the unrepeatability of performance experience in a 1969 review of the mixed media performance ensemble Single Wing Turquoise Bird: “always only once.” Contemporary performative digital practice shares some parallels with these earlier performative practices: the work may be performed live by a performer, or an algorithm may perform the work automatically. In either case, preservation faces the paradox of recreating moments that were intended to happen “always only once.” Examining 20th century attempts to preserve the ephemeral can inform not only how we approach preservation of performative and process-based digital works, but also which works we attempt to preserve.

## Keywords

Digital preservation, digital archiving, expanded cinema, digital performance, algorithmic art, light shows, color organs, live coding, networked art

## From Object to Algorithm

A problem frequently arises in digital media art curation and preservation: the presumption that artworks are tangible, or at least static, is at odds with the realities of computational media practices. The contradiction was evident by the mid-to-late 1990s, at the point when the concept of net art (then often known as “web art”) first began to take hold. But, historically, when “new media” first emerge, they typically imitate the forms of their predecessors: early photography imitated painting; early cinema imitated theatre. Early “web art” was still popularly perceived as the placing of art objects – paintings, sculptures, photos, etc. – on the internet.

But net artists like Olia Lialina were already working beyond such assumptions; they were working with the form of the internet. Lialina’s 1996 “My Boyfriend Came Back from the War” was interactive and dynamic. [1] And it implicitly proposed a cinematic language specific to net art, using browser frames and space as narrative elements. The “art object” of “My Boyfriend Came Back from the War” was not an image: it was HTML code, written in dialogue with the rendering capabilities of 1996 browsers. As a dynamic, code-based work, “My Boyfriend Came Back from the War” presents different issues for exhibition and preservation than a static work. Perhaps not coincidentally, Lialina has gone on to become a prominent figure in pushing the thinking about preserving net-based works.

Yet “My Boyfriend Came Back from the War” in some ways still functions as an object. The code is self-contained and complete; it does not access external data or run any generative processes. The files are static data and HTML code; they are not executable. As a result, the archival issues are more about the display – the foreground – than the processes taking place in the background. This is something of an oversimplification. In fact, Lialina’s digital

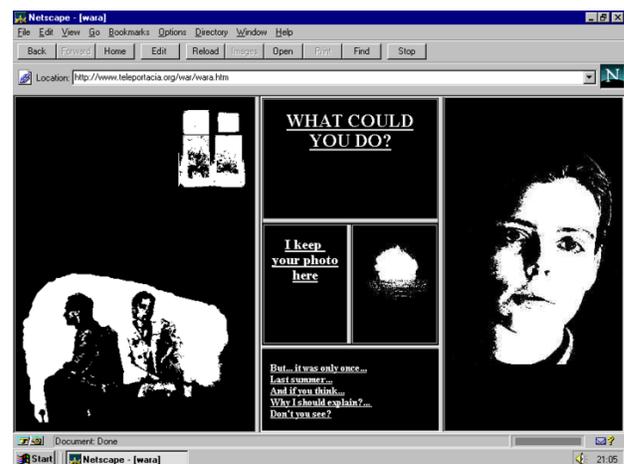


Figure 1 – Olia Lialina, "My Boyfriend Came Back from the War," 1996. Image courtesy Olia Lialina.

preservation work has often emphasized historical digital and exhibition context, including the ability of later browsers to properly interpret earlier HTML code like that in “My Boyfriend Came Back from the War.” But these computational concerns still focus primarily on the display, versus the generation of the content itself.

But by the mid-1990s, process-based net-based art was also being created. My first net art piece, “The Multi-Cultural Recycler,” was a generative work based on my semi-ironic prediction of a near future web celebrity phenomenon. [2] My prediction, and the Recycler, were based on the growing popularity of early webcams; it would be almost ten years before YouTube launched. The project’s title is a pun on the early web’s awkward attempts at multi-culturalism – which were basically cultural homogenization – and the popular 90s phenomenon of cultural recycling.

The Multi-Cultural Recycler allowed users to choose live webcam images and recycle them into kitschy artworks. It ran server-side software that downloaded two to three live images from a continuously updated selection of internet webcams, then ran custom image processing routines that would generate collaged kitschy images.

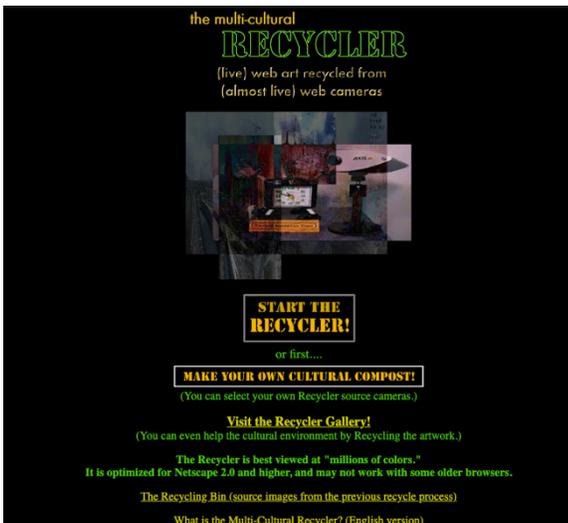


Figure 2 - "The Multi-Cultural Recycler," ca. 1997

The Recycler was always performing and always changing. This made preservation quite a challenge. I have the project documented with screenshots of various pages and images generated by the project on a handful of days. I also have a screen-capture video that I made in the late 90’s to document the navigation. But the video, like the screenshots, shows the site on a certain day and time in the 1990s. There’s no adequate way of archiving something that ran and changed

<sup>1</sup> The connections between Happenings and John Cage scores run deeper than mere similarity. An event organized by John Cage at Black Mountain College in 1952 featured several unrelated

performances by various artists that occurred in structured time brackets, sometimes simultaneously. The event is often considered by historians to be a direct predecessor to Happenings.

continuously over nearly twenty years. It’s durational and performative. The Recycler is no longer running. Ironically, although we usually worry about software obsolescence when we talk about digital preservation, it was the physical vulnerability of objects that did the Multi-Cultural Recycler in. It finally stopped running live in late 2015, when both the main server and backup servers were destroyed in a plumbing flood. So just like any artwork, digital artworks are vulnerable to their own physical fragility.

But net art performativity and process weren’t actually new in the 1990s. Networked art was performative as far back as 1980. “A Hole in Space,” by Los Angeles artists Kit Galloway and Sherry Rabinowitz, used satellite networks to transmit video, long before the days of webcams and video chat – or even public access to the internet. [3] The project transmitted and displayed life size video images of visitors at Lincoln Center in New York into a department store window in Los Angeles. Simultaneously, it displayed life size video images of visitors at the store window in Los Angeles to their counterparts at Lincoln Center.

The artistic focus of “A Hole in Space” was not the transmission of the images themselves, but the social interactions that happened over time across the network between people thousands of miles apart. If we think about the nature of networks as conduits across which things flow, it makes sense that duration and performativity would be more or less native to networked art.

“A Hole in Space” has unusually thorough video documentation for its day: some video was recorded by local news crews; other footage was created by the artists and their associates. So, video documents this particular work of performative early net art. But video cannot archive or preserve the event. It happened only once.

Performative and artistic interventions may seem to fit naturally with electronically networked art, but of course they didn’t start there. Surrealist performances and Hugo Ball’s Cabaret Voltaire are recognized as early 20<sup>th</sup> century performance art precursors. [4] “Happenings,” launched by Allan Kaprow and others in the 1950s and 60s, were performance art interventions, usually intervening into public space. These events were generally scripted, with both artists and members of the public given instructions of what to do when. The performances were part theatre, and, like a John Cage score,<sup>1</sup> part instructional algorithm set into motion. In the case of the Happenings, what was ultimately important were the social outcomes that took place in the space of the social network between the participants. By the late 1960s and early 70s, the term “Happening” was used colloquially in the US as a general term to refer to the energy of free-flowing social interactions.

performances by various artists that occurred in structured time brackets, sometimes simultaneously. The event is often considered by historians to be a direct predecessor to Happenings.

As we think about archiving contemporary digital performance practices, we have a few problems to consider. Figure 3 shows the live coding group Reggaetron performing at an Algorave. [5] An algorave is a live coding event inspired by raves. At an algorave, attendees dance, party, drink, etc., to the sound and image of algorithmic music being coded live. The photo depicts performers, the performance, and the crowd. And importantly – the process: live coding. We can't experience the process directly because it's the artists' creative process. We experience its representation – its documentation – in what we see on screen and what we hear. At the performance, we experience this representation in real time as the performer creates it. In documentation, it's past tense.



Figure 3 - RGGTRN at International Conference on Live Coding, 2017. Image courtesy RGGTRN. Credit: Tatiana Durán.

But the crowd is important in the photo too; it suggests all that the image can't communicate. What about the event? The social interaction? The Happening? The Rave? You can try to take crowd video that captures the energy. But the Happening can only be represented – in the form of images and sound.

Live algorithmic performance doesn't just refer to live human performers, however. Algorithms are processes, which, once launched by their human creators, can continue to perform over time indefinitely. For example, in my recent project, "What the Robot Saw," algorithms continually curate newly uploaded videos from YouTube that have very few subscribers or views. [6] These are videos that search and recommendation algorithms often render invisible – so they might be seen only by online robots. Algorithms then edit, crop and sequence the curated videos into a collaged, livestreamed film. When human speakers (aka "talking heads") appear onscreen, "What the Robot Saw" labels them using Amazon Rekognition's marketing-oriented, neural net-based face analysis algorithms, which aim to determine demographic and emotion data.



Figure 4 - Still from "What the Robot Saw," 2020

The resulting algorithmic stream runs endlessly, and it's always in the moment. It's an endless performance: the algorithms are the performers. What to do about archiving that? You can document segments, but as with the Multi-Cultural Recycler, they are just snapshots in time. But performance – especially with time-sensitive elements like recent videos – is always in the moment. Archives will always be representations of an ever-receding past.

How can we think about this? Let's look to the past for guidance. Liquid light shows were a type of visual performance that mainly took place in the late 1960s. These were mixed media projections that were performed at concerts and other events. The events sometimes tied in with LSD experimentation and other deliberate attempts at conscious altering experiences. Light show ensembles projected combinations of films, slides, strobing colored gels, and colored oils onto the screen.

The Los Angeles light show ensemble, Single Wing Turquoise Bird were known for their intensely collaborative, multilayered projections. A high level of improvisational, intuitive collaboration between members was necessary for the individual performers to create a cohesive whole with one another's projections and with the music. The ensemble performed at a range of events from rock concerts to collaborations with avant-garde musicians.

### Always Only Once

Some of the writing from the time of Single Wing Turquoise Bird's performances can be useful toward thinking about current questions of performance preservation. Gene Youngblood wrote in his 1970 book, *Expanded Cinema*: "Unlike other light artists, The Single Wing Turquoise Bird has no definite program; each presentation evolves from the interacting egos of the group working in harmony. What we see cannot be called a work of art as traditionally conceived: a unique, perishable, nonreplaceable entity reflecting the talents of an individual. They don't produce an object in the sense that a movie is an object; they produce software, not hardware." [7]

Film historian William Moritz reviewed one of the group's performances in 1969 for Los Angeles's *Weekly Planet*. After describing the various visual elements of the show, Moritz, adopting a Gertrude Stein-like syntax, wrote: "These words are not telling it all because it is a 1960s thing and most English words are a 14th or 16th century thing and if Single Wing Turquoise Bird could be writing it they would be writing it, but they are showing it and always only once because Friday January 17, 1969 was not like Saturday January 18, 1969, even though many things about them seemed to be being the same and if you did not see Friday January 17, 1969 when it happened you will not have a chance now because it was living not writing and this is just writing you are doing now..." [8]

Moritz's "always only once" might be a good approach to how we think about archiving of contemporary media performance as well. The "happening" can be represented and documented, but never really archived or preserved. And from a practical perspective, it can be quite difficult to capture good sound and image in a live audiovisual performance setting with the type of inexpensive setup available to most non-commercial performing artists. It might be tempting to give up. But the problem is, historicization depends on documentation.

Single Wing Turquoise Bird was a real light show. But the images (Figures 5 and 6) are from a Hollywood film. In the late 1960's, Hollywood director James Bridges attended some of Single Wing Turquoise Bird's performances, having learned about the ensemble from the painter Sam Francis, who was a patron of the ensemble. [9] When Bridges co-wrote and directed the 1970 feature, "The Baby Maker," he included a scene that takes place at a light show, with Single Wing Turquoise Bird performing and appearing as the light show ensemble.



Figure 5 - Still from Single Wing Turquoise Bird performance in the 1970 National General Pictures film, *The Baby Maker*. Photo courtesy Michael Scroggins.

Creating film documentation of their visual performance was impossible for Single Wing Turquoise Bird themselves. Pointing an available 1960s movie camera at a projection screen would not have produced a satisfactory result. For "The Baby Maker," the movie production company worked with the light show members to shoot and composite layers of their performance, producing a high-quality clip that was inserted into the film. Since the ensemble appears in the film performing their visuals, the scene in which they appear also serves as documentation of the performance itself, albeit fictionalized.



Figure 6 - Still from Single Wing Turquoise Bird performance in the 1970 National General Pictures film, *The Baby Maker*. Photo courtesy Michael Scroggins.

Single Wing Turquoise Bird were a highly regarded light show that received significant critical attention during the period they were active. But they are also one of the few 60s light shows for which there is adequate documentation for historians to view and analyze. This has likely helped them to become better historicized over the years than some of their peer light shows who lack strong documentation.

The existence of Single Wing Turquoise Bird's documentation is due in part to luck. Although they were clearly a prominent light show, they were also in the right place – Los Angeles – at the right time and with the right connections to appear in a film. But we also understand that the film is just documentation at best. As Youngblood and Moritz's texts point out, the light shows were "always only once" and could never be preserved. Anything performative never can be.

Sixties light shows were a form of "expanded cinema," a term coined in 1966 by the American experimental filmmaker Stan VanDerBeek. Gene Youngblood went on to make the term "expanded cinema" famous in 1970 with his book by the same name, which I have mentioned previously. Youngblood's book, which was influential in establishing the field of media arts, proposed that cinema had expanded beyond film to incorporate television, video art and computer art.

Despite the term's 1960s origins, broad views of expanded cinema can encompass earlier forms of non-

narrative moving image, often invented by independent artists, inventors, and tinkerers. Contemporary practices we've been discussing, like live coding, live audiovisual performance, and algorithmically generated cinema can also be considered expanded cinema performative practices.

Now that we've looked at some of the issues around documenting 1960s liquid light shows, let's consider some even earlier cases of expanded cinema performance documentation practices. Histories of modern visual performance often begin with the color organ. Color organs comprise a broad category of visual instruments that have taken various forms. However, most involve some sort of a machine that is designed to be performed with a keyboard, but which produces colored light instead of pitched musical sounds.

Credit for the first color organ usually goes to Father Louis-Bertrand Castel's 1700s invention, the ocular harpsichord, which generated colored light using candles. Various color organs were developed over the next two hundred years, but development became more active in the early 1900s when access to electricity became more widespread.

One twentieth century color organ inventor was Mary Hallock Greenewalt. Greenewalt was born in Syria but moved to the US as a child, where she lived most of her life in Philadelphia. Greenewalt trained as a classical pianist, then decided to devote herself to development of the art of performing colored light. Greenewalt named the performance instruments she invented – the color organs



Figure 7 - Mary Hallock Greenewalt, half-length portrait, at electric light "color organ", which she invented, 1925, Underwood & Underwood. Library of Congress, Prints & Photographs Division, LC-USZ62-93477.

<sup>2</sup> After World War II, Wilfred developed several larger, self-playing Lumia systems as museum and commercial commissions. Yale University Art Gallery restored several of these for a 2017

themselves – “Sarabet,” after her mother. She called the art of color light play that she was developing, “Nourathar.”

Greenewalt's contemporary and rival color organ developer Thomas Wilfred was born in Denmark and spent most of his life in New York City. Like Greenewalt, he gave the art of color-light performance he developed a name distinct from that of his color organ inventions. He referred to his color organ as the “Clavilux,” and he referred to the art of color light play that he developed as “Lumia.”

Wilfred has been better historicized over the years than Greenewalt. Although Greenewalt's work has received increased attention in the past few years, up until recently it was difficult to find much written about her work at all. Although both Greenewalt and Wilfred presented and performed publicly, Wilfred has been cited within visual performance histories far more consistently than Greenewalt.

Wilfred received attention from the contemporary art world during his lifetime, which Greenewalt did not. As a result, Wilfred received more substantive press attention than Greenewalt, who was typically treated as a novelty performer in press reviews. So, it is easy to see why Wilfred's work would be treated differently by historians. But it is difficult to discern how much of the difference in their access to performance venues and critical attention during their lifetimes derived from their work vs. personal attributes like gender and demeanor.

There may be another factor that facilitates discussion of Wilfred's work by a larger number of contemporary historians. Like Single Wing Turquoise Bird, Wilfred's work benefits from fortuitous documentation beyond what would have ordinarily been available at the time. Wilfred, Greenewalt, and most other color organ inventors continually tried to figure out ways to make a living from their work. Wilfred had tried both exhibiting his Clavilux in the art world and performing it in the music world. Eventually, he had an idea to develop a home version of Clavilux he could sell to consumers. This version would play automatically, rather than having need for a performer. Wilfred called this system the Clavilux Junior.

The Clavilux Junior operated through the use of hand painted glass records, each with an opus number. Light was projected through the records, reflected off various surfaces within the machine, and eventually projected onto the screen. The user could use the keyboard to make various adjustments to the light as the records played.

There are several Clavilux Juniors known to still be extant, mostly in private collections. Those that are operational can play their glass records, so the units can be exhibited as video sculptures in contemporary exhibitions.<sup>2</sup> In addition, their screens can be recorded with modern video

exhibition. Yale has produced high quality video documentation of the output of these later systems. As with Clavilux Junior documentation, the Yale documentation is available online. [12]

equipment. So, Wilfred’s original 1930’s time-based light works are now documented in contemporary high-definition video.

Operating the Clavilux Junior machine ninety years later recreates the original “algorithmic” performance, rather than merely representing it. The marks painted on the glass disks function as executable software code that generates time-based visuals – and the software can still be run. So, we find ourselves able to view contemporary high-definition video documentation of generative work from the 1930s. Doing so feels like time travel.



Figure 8 - *Thomas Wilfred at Clavilux Keyboard*, ca.1930. Image: Thomas Wilfred Papers (MS 1375). Manuscripts and Archives, Yale University Library.

Clearly, the success of this approach emanates from the fact that Clavilux Junior was a self-contained hardware system that was produced in some quantity and distributed to people in various geographic locations, providing redundancy against loss or damage of individual units. That said, Clavilux Junior’s painted records are essentially rare software disks recorded on very fragile media: it’s fortunate that a number of the glass records have survived. In any case, Clavilux Junior shows us the advantages of keeping our eyes open to the possibility of time travel.

There’s comparatively little visual documentation of Mary Hallock Greenewalt’s Sarabet output. I am not aware of an extant, functioning Sarabet that can generate the work, and there’s also little photographic documentation from the time. But there is a great deal of documentation of Greenewalt’s process. She gave lectures and performances,

and those were reviewed in newspapers. But she also did an extensive amount of self-archiving. As her papers reveal, during her career she continually seemed to feel she was not receiving the credit she deserved for her inventions. Apparently for this reason, she saved and often annotated a vast quantity of materials documenting and discussing her work. She continued this self-archiving over the course of her career. In 1936, she began donating the materials from her archive to the Historical Society of Pennsylvania. She continued these donations until 1949, a year before her death. [10]

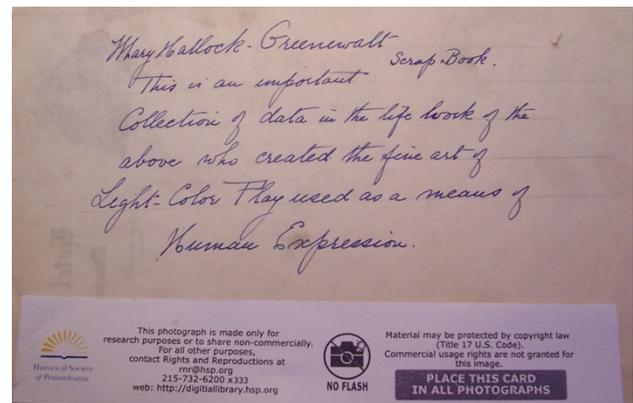


Figure 9 - Handwritten note, Mary Hallock Greenewalt, *Mary Elizabeth Hallock Greenewalt papers* [0867]. Describes a scrapbook within her archives. Photo by the author. Reproduced with permission from the Historical Society of Pennsylvania.

The Historical Society of Philadelphia’s *Mary Hallock Greenewalt papers* collection contains thirty-five boxes, which the public can request to review a few boxes at a time. The boxes contain thousands of pieces of paper that historicize Greenewalt’s practice and research: newspaper press clippings, technical diagrams, lecture notes, jotted ideas, letters to vendors, notes from the many times she challenged what she felt were infringements on her intellectual property. While being able to operate and document Wilfred’s Clavilux Junior has value, there is something in the vastness of Mary Hallock Greenewalt’s archive – the obsessive performance of self-archiving – that archives Hallock Greenewalt’s work in a way no machine, nor film of a performance, could do.

That Greenewalt’s archive is preserved at Historical Society of Pennsylvania is no doubt fortunate; one guesses that the materials likely would have otherwise been destroyed. But with the archive housed in boxes in Philadelphia, the materials are invisible to most of the world. So, over the past several years, I’ve been endeavoring to make them more visible. I periodically travel to Philadelphia and photograph as many items in the Historical Society archive as possible. I then post the images in a public online archive I call the Mary Hallock Greenewalt Visibility

Project. [11] The visibility project itself is in some ways performative: the posting of the multitude of images mirrors Greenewalt's performative, almost compulsive compilation of the vast archive that documents her process in a way she knew nobody else would.

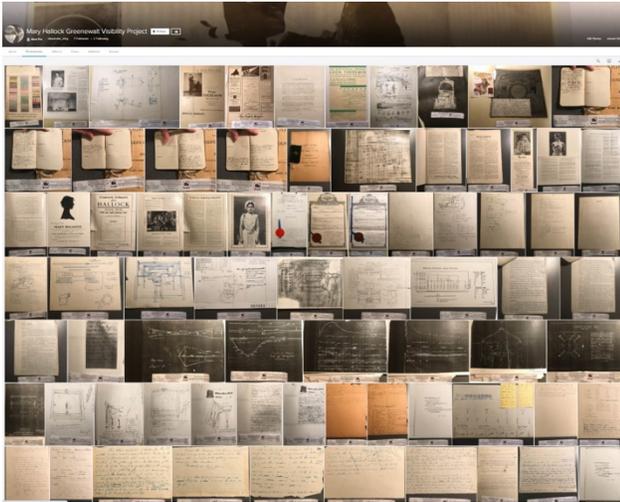


Figure 10 - Partial screenshot of Flickr "Photostream" view of Mary Hallock Greenewalt Visibility Project website.

Part of my process involves displaying lengthy streams of unlabeled images, to document the extensiveness and eclectic nature of Greenewalt's archive. But I also organize the items using keyword tags, so that the public can discover new connections and networks between the many disparate items in the archive. My database is very crude and incomplete; it is limited by time and resources. But the act of producing an online archive of scrap clippings compiled by an artist who died in 1950 always feels to me like another act of time travel. As with Wilfred's *Clavilux Junior*, I think it's always useful to look for these less obvious opportunities to connect preservation and historicization of the present to the work of the past.

### Lessons of the Past

What might we learn from these past expanded cinema practices that can be useful in thinking about archiving of process-based computational work?

#### "Always only once."

Although a half century of consumer recording technology might confuse us into thinking otherwise, reflecting on William Moritz's description of the unrecordable, performative and social energy of Single Wing Turquoise Bird's events should give us some clarity. We can consider the failures of adequately preserving processes,

performance and happenings a success.

#### **But don't let the "always only once" paradox of preservation stop us from documenting and historicizing.**

We can consider how alternate forms of documentation and archiving can function to represent practices for which the process is more important than the display.

#### **Alternate approaches can be especially important in increasing visibility of historical and contemporary practices that might otherwise be overlooked.**

Considering how visibility impacts history, we can try to think proactively – and retroactively – about how we can make hidden histories more publicly visible. Are/were groups underrepresented within their practices also underrepresented in access to traditional forms of documentation and archiving?

#### **We can consider an artist's attempts to historicize their practice as an archived work in itself.**

The performance of archiving may be as significant as the archive that's created. Broadening our thinking about what constitutes an archive, as well as ambiguity between practice and archive, can allow us to broaden our recording and understanding of the histories with which we engage. Always look for opportunities for time travel.

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## Author Biography

Amy Alexander has been making computational` art projects since the 1990s. She is a Professor of Computing in the Arts in the Visual Arts Department at UC San Diego. Alexander has worked in performance art, installation, software, and online media, generally employing custom software to generate real-time video that reflects on cultural issues. She has written and lectured on topics including software art, historical and contemporary audiovisual performance, algorithmic bias and algorithmic determinism, and media preservation. She has served as a reviewer for festivals and commissions for new media art and computer music.

Alexander's projects have been performed and exhibited at venues ranging from The Whitney Museum, Prix Ars Electronica, Transmediale, SIGGRAPH, ISEA, NIME, and the New Museum to club performances at Sonar (Barcelona), First Avenue (Minneapolis) and Melkweg (Amsterdam). She has also performed on the streets of Los Angeles, San Diego, San Jose, Zürich, and Aberdeen, Scotland.

# AR[t]chive – Augmented Reality Experience for a Digital Art Archive

Tiago Martins, Christa Sommerer, Laurent Mignonneau

Interface Culture Department, Institute for Media, University of Art and Design Linz  
Linz, Austria

tiago.martins@ufg.at, christa.sommerer@ufg.at, laurent.mignonneau@ufg.at

## Abstract

This paper introduces an immersive augmented reality (AR) experience of interactively exploring a digital archive. AR[t]chive is being designed for an exhibition context but also to serve as a research tool, around the content of the Archive of Digital Art (ADA). Archive contents are presented as virtual elements arranged in real space. Users are able to walk among these, manipulate them directly using their hands and use virtual tools to create compositions in 3D space. This work is part of a larger collaboration and represents an exploration of future-facing ways to access and utilize ADA, but can also inspire work on other digital archives. The paper outlines the design of the interactive experience, including the different considerations taken. This is followed by a description of the current implementation, which constitutes work in progress. To conclude, we offer a brief outlook and future directions.

## Keywords

Augmented reality, mixed reality, digital archive, information visualization, interactive art, interaction design, human-computer interaction, embodied interaction.

## Introduction

Museums and archives may benefit from harnessing the latest digital technologies for better preservation and dissemination of knowledge. [1, 2] Archives which are natively digital hold an advantage in making their content available remotely via digital means, such as web-based user interfaces; offering complex functionality for (re)searching, cross-referencing, organizing and displaying different types of content; and allow users to create and share personalized collections. [2, 3] As the case in point, augmented reality (AR) can allow visitors to interact with and dive deeper into artifacts which are otherwise kept safe behind glass panes. [4, 5]

Due to technical advances and a marked push from tech giants, AR has become increasingly commonplace. Besides the technical facilities offered by personal computing devices such as smartphones and tablets, consumers also increasingly gain access to head-worn AR devices – such as

the Nreal Light headset, which resembles a pair of sunglasses. [6] The tendency is for AR to become ever more prevalent in daily life, complementing or even replacing smartphones as the de facto personal interface for communication, entertainment and information access. [7]

While the user interface (UI) of AR devices like the Nreal Light or the Microsoft HoloLens borrow much from that of screen-based mobile operating systems (such as Android or iOS), soon enough it will be commonplace to access and interact with virtual objects spatially present in our real environment – among real people and objects, while on-the-move, using gaze, voice and/or gestures.

The design space for user experience (UX) and interaction in AR is still open for experimentation. [7] A native AR experience for a digital archive benefits not only that specific archive, but may also be translatable to other archives or collections; and inform the design of future AR applications such as browsers or even operating systems.

## AR[t]chive

In this paper we introduce AR[t]chive, an augmented reality (AR) experience which offers participants an embodied and playful way of interactively exploring a digital archive, based on the Archive of Digital Art (ADA, for short) and with focus on the interactive artworks of C. Sommerer and L. Mignonneau. [8, 9]

AR[t]chive is being developed as part of the project “LeFo – Lehr- und Forschungsinfrastruktur für Digitale Künste an Hochschulen” (trans. “infrastructure for education and research in higher education”, please see Acknowledgements for more details). Briefly, the project concerns the expansion of ADA both as archive and as network, as well as the development of immersive interfaces that allow users to access and browse the contents of the database in future-facing ways. With AR[t]chive we explore the possibilities for data visualization and interaction offered by a wearable AR device, the HoloLens 2.

## Related Work

Chen introduced an early approach to a virtual reality-based interface for a collection of digital documents. These and the relationships between them are visualized as a force-directed graph. [10] The author introduces a content-based similarity model and addresses issues such as information density.

The works *The Living Room* (2001) and *The Living Web* (2002) by artists C. Sommerer and L. Mignonneau serve as examples of immersive intelligent spaces which track the visitors' gestures and speech, to "engulf" them in images related to their actions and conversations. [9] The project *Naked in Paradise* (2017, ongoing) by Luc Courchesne, is an immersive interactive VR database where assets such as photos, videos, audio clips, texts and 3D objects collected from the artist's personal experiences can be organized and displayed in different ways (such as in a timeline or by categories). [11]

The work *Legible City* (1989) by artist Jeffrey Shaw serves as an earlier example of using text to populate a city-like virtual space which users can explore. [12] More recently, the HoloLens app *Type in Space* enables users to create immersive sculptural or architectural elements by laying out virtual text three-dimensionally in real space. [13]

## Technical Framework

The Microsoft HoloLens 2 headset was chosen due to its comfort factor and technical characteristics, and the style of AR experience it offers. These include:

- wearability factor and the see-through display which allows participants to remain aware and able to act in the physical environment;
- native capability to scan the geometry ("mesh") of the physical environment, which can be used to simulate physical interactions between virtual elements and the real environment;
- native hand-tracking allowing for experiences where participants interact with virtual elements using their hands.

The device also provides eye-tracking and speech recognition facilities, which may help to increase accessibility (e.g., for participants with motor limitations), provide an alternative to a virtual keyboard for text-based input and queries or (more generally) complement gesture-based interaction.

The HoloLens 2 is a high-end device meant for enterprise use-cases. While accessible in a research or art production context, it is not a mass-market product. However, it is reasonable to expect that within a few years consumers will have access to similar devices, with a form factor approaching a pair of glasses. While the HoloLens 2 provides for a presently rather unique interaction style, it nevertheless allows us to design and experiment with scenarios likely to be relevant in the near future.

That said, it is conceivable that the experience can be adapted to some degree for more commonplace devices –

smartphones and tablets. Hand-tracking frameworks for mobile devices are already maturing, and some of the latest iPhone and iPad models come equipped with a LiDAR (light detection and ranging) scanner, able to capture the geometry of the physical environment.

## User Experience Design

AR[t]chive is initially intended as an installation or experience within an exhibition context, where the wearable device is provided for visitors. This opens up the UX design space for exploration and experimentation. On a longer-term, AR[t]chive or a subset of its features would ideally be made available to users in a wider context (e.g., as a downloadable app for mobile devices) including those who wish to explore ADA for research purposes. As a result, we try to balance the possibilities of playing with the archive content at an exhibition setting with the more utilitarian aspects of the software as a possible tool for research contexts.

## Archive Content

The types of media that we can primarily retrieve from ADA helped to shape the design space. These are mainly and presently images, videos and text of varying length, including: artwork and manuscript titles; names of artists, collaborators, institutions and events; abstracts and descriptions. Relations between entries in the database can allow us to display or derive these contents in many forms, for instance as timelines, maps, or clouds.

The Archive of Digital Art contains thousands of entries for artworks alone. To these are connected artists, institutions, events, media and publication, among others. To facilitate our first steps we opted on focussing first on eleven artworks by Sommerer & Mignonneau, as the AR experience will feature in a traveling exhibition format developed around these. We later included the remaining artworks by Sommerer & Mignonneau, using a combination of data from ADA and data provided by the artists themselves (essentially, the archive of the artists' website).

## Technical Factors

The characteristics of the device influence the interaction design to an extent. Among these, the characteristics of the display are a major factor.

The waveguide display essentially draws using light, and is referred to as a "holographic display". [14] In contrast to camera-based AR – such as that on tablets and smartphones, where a camera image is captured, augmented with virtual elements and then displayed to the user – the HoloLens projects light to the wearer's eyes. This means that virtual objects with darker colors will either be perceived as transparent or altogether not visible. When displaying a virtual object, image or video in front of a bright surface (such as a white wall), the darker parts of the object or image can be hard to perceive. Thus, the visual design of the HoloLens' native UI employs vivid, bright colors, and its components are referred to as "holograms". [14]

While the user is able to see their surroundings clearly through the transparent visor, the field of view of the waveguide display itself is comparatively limited. If the user approaches a large virtual object, the “seam” between the AR display and the user’s natural field of view would become apparent as the object would be “cut” at the edges. In general, scenes composed of a few relatively small elements (such as a model of the solar system) work better than large elements (such as a car in real scale) or compositions with high density (such as a realistic model of the Milky Way).

### Design Guidelines

Taking into account the factors presented above, we adopted the following guidelines.

- A *simple visual style*, considering the device’s limited capabilities and the eventual number of elements to display. Additionally, should the experience be extended to other archives, the visual identity of the interface remains subdued in relation to the actual content.
- *Small modular elements*, especially considering the field of view limitations mentioned above. Small elements also lend themselves better to manipulation. Modularity helps with displaying collections consistently, or creating aggregations at run-time for data visualization. Users can also benefit from modularity, more concretely in using elements as construction pieces (see below).
- *Enable playfulness and creation*, through direct manipulation of elements and by harnessing their modularity. Ideally, information retrieved from the archive can be presented as units or assemblies of virtual “construction blocks” with a consistent behavior. Participants can combine elements to create their own content.

Exhibition visitors may freely experiment and play, even if they are not initially interested in the archive content. Goal-oriented users (e.g., researchers) can follow trails and discover connections, assemble mind-maps and clouds, create moodboards or curate AR exhibitions. This type of open-ended, playful engagement can potentially inform future directions for UX design.

Inspiration was taken from multiples sources, including: construction set toys and games with modular components (such as Lego, BRIO, and also Minecraft); AR/VR creativity and design tools (such as Tilt Brush, Gravity Sketch and Type In Space); as well as link charts or mind maps (such as the investigation boards often depicted in detective movies).

A storyboard draft (Figure 1) was developed to illustrate the interaction aspects of a user’s journey, introducing the basic elements which served as a starting point for the first prototype. The current implementation, described below, is quite close to the storyboard.

### Current Implementation

The prototype is being developed iteratively and is considered work in progress. Features are added mostly step-by-

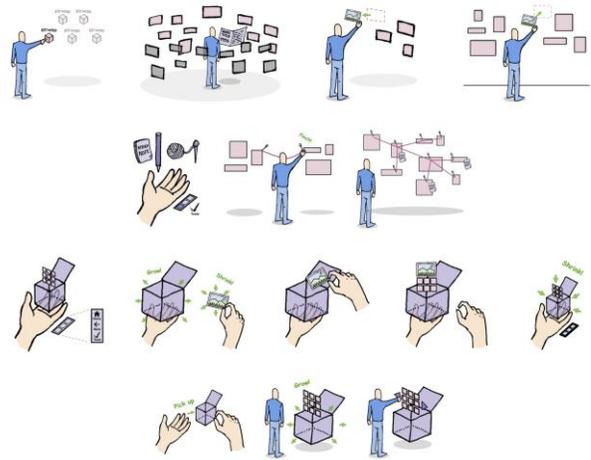


Figure 1. Interaction design storyboard (condensed).

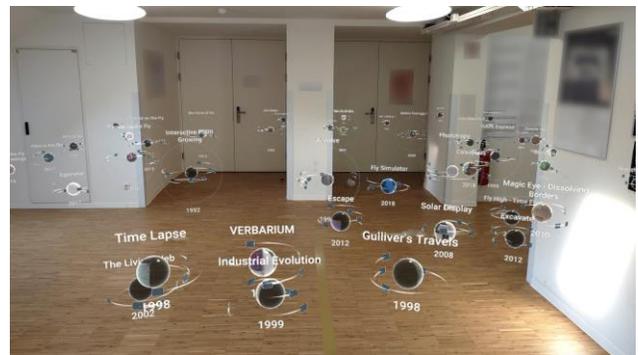


Figure 2. Starting home view, resembling a galaxy.

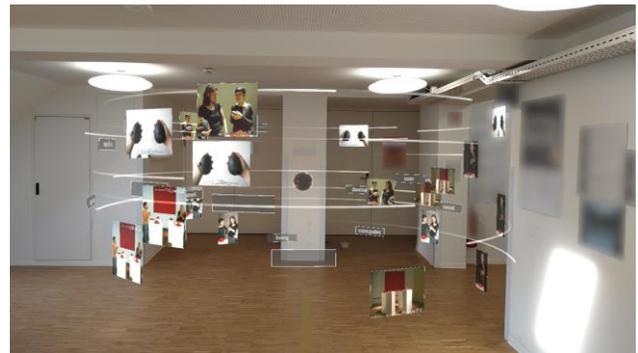


Figure 3. Media related to an artwork, displayed as a swirl.

step and tweaked afterwards. You may refer to the storyboard (Figure 1) as visual aid.

The software is being developed using the Unity game engine, the HoloLens development kit and tools provided by Microsoft, including the Mixed Reality Toolkit (MRTK).

### Home (Galaxy)

The participant is initially presented with floating virtual objects representing each of the artworks. While originally

simpler, this “home” scene has evolved to something resembling a galaxy (Figure 2). Each work is represented as a spherical “core”, textured with a representative image, or orbited by small quads (a miniature representation of the “swirl” – see below). The name and year of the work appears as text, respectively above and below the core, and self-orienting towards the user. The eleven selected works are arranged in a circle around the user. They are larger and encased in a distinctive glowing sphere. The remaining works are scattered radially outwards, further away than the selected works.

Touching one of the works will cause it to expand into a “swirl” of media (Figure 3). As if “zooming in” on the selected work, the entire home scene expands until all other works fade from view.

### Swirl and Media Items

The media swirl (Figure 3) is composed of “media items” (images, video, keywords) related to the work, orbiting its spherical core. Projecting from the core towards the floor is a handle, which can be grabbed and moved to reposition the swirl in space (rotation and height are constrained). The swirl serves as an example of how a collection of media may be displayed – in this case related to one work, orbiting around a focal point but otherwise not organized/sorted in a specific way.

Each of the media items in the swirl can be picked up individually. An item can then be moved, rotated, and released at a desired position outside of the swirl. When brought close to a real surface, a dotted line will appear; and the item will attach itself to that surface when released (Figure 4). In this way the user can arrange items according to their preference and use the characteristics of the physical space to support layout and composition. Items can be scaled by grabbing them with both hands and either pulling outwards (enlarge) or pushing inwards (reduce).

### Keywords and Word Clouds

When a keyword is scaled beyond a certain size, it will expand into a word cloud of related words (Figure 5). To reduce clutter, the swirl (or generally, the currently displayed collection) expands into the distance and fades from view. The expanded keyword remains at the center of the word cloud, and can be scaled down once again, contracting the cloud and bringing back the previous swirl (or generally, the currently displayed collection).

Keywords in the cloud can be manipulated much like in the swirl; and can also, in turn, be expanded into a cloud of related keywords. This constitutes a mode of sequential navigation which can later be extended to other media items and UI elements. Generally, and much like the swirl, a cloud could conceivably be composed of heterogenous elements.

To make the word cloud possible, keywords are currently mined from each artwork’s descriptive text. The resulting list of relevant words is manually curated (e.g., some similar or closely-related words are combined). For each keyword we keep an overall count, but also a count per artwork, and



Figure 4. Attaching items to a surface.



Figure 5. Keyword expanded into a word cloud.

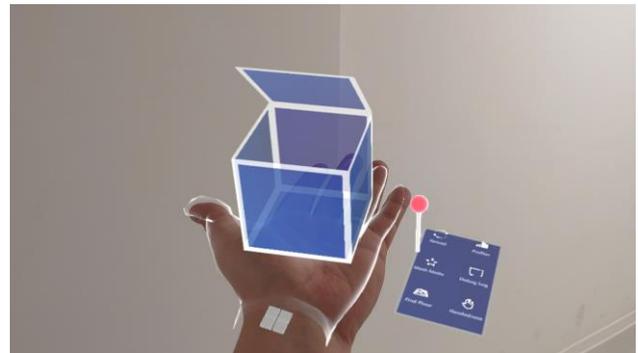


Figure 6. Tools on the user’s palm: inventory box and pin.

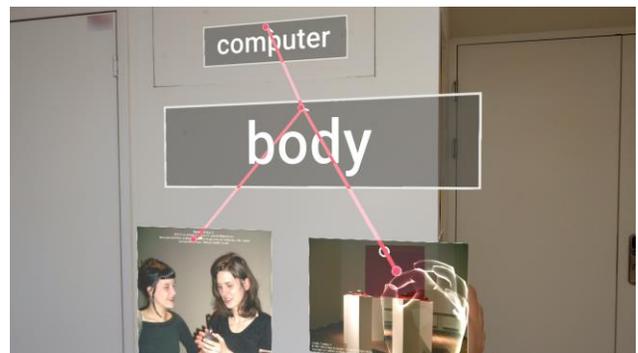


Figure 7. Connecting items with the pin tool.

a count of related words (i.e., for a given keyword, those that appear often in the same texts).

## Tools

The participant can access a set of tools in the palm of their hand (Figure 6). The pin can be used to create lines, connecting items placed in the world (Figure 7) – that is, not those in a collection like the swirl or word cloud. Also on the user’s palm is an inventory box for storing media items (figure 6). Dragging a media item into the box will store it inside. The box is transparent and displays the most recent items. Given the box’s small size, in order to retrieve items from within the user must first pick up the box and drop it near the floor, in which case the inventory enlarges and displays a paginated view of contents, which can now be grabbed (Figure 8). The enlarged inventory can be picked up, in which case it returns to its smaller size; and placed back on the user’s hand.

The inventory makes it easier to transport several items at a time across a room, but will serve other purposes at a later point. Conceivably, users may be able to switch between several inventory boxes, label them and save them into a personal account.

## Conclusion and Future Work

We have introduced AR[t]chive as an augmented reality experience for a digital archive; and an exploratory design for a research tool. While this constitutes work in progress, at the current stage AR[t]chive makes it possible to view archive data as virtual elements in a real three-dimensional space; to manipulate and rearrange these directly using one’s hands; and to feel truly immersed in the resulting composition.

An augmented reality environment may allow users to remix and recontextualize archived materials in ways that would not be feasible using other interfaces or interaction frameworks – for instance a web-based UI. Ideally, users should equally be able to create a link chart for research or a virtual sculpture for fun – depending on their mood or goal.

The interaction design is left open to accommodate further tools, containers, collections or arrangements of archive data. By keeping the audiovisual design, interaction design and behavior consistent between the basic elements we may generate other structures based on these, as data visualizations based on the different types of relation present in the digital archive.

In the longer-term, participants should be able to save their compositions – arrangements of media items and other elements in physical space – and view them later, e.g. on a mobile device and/or web interface. It is also desirable to accommodate a multi-user experience, with multiple users wearing AR headsets, or even a mobile-friendly version of the software.

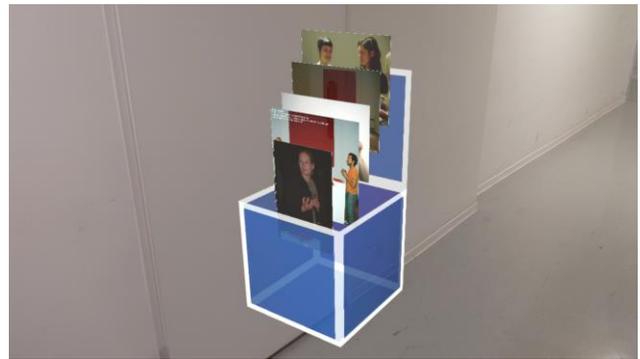


Figure 8. Inventory placed in the environment.

## Acknowledgements

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# The Australian Emulation Network: Accessing Born Digital Cultural Collections

Melanie Swalwell

Centre for Transformative Media Technologies  
Swinburne University of Technology, Australia  
[mswalwell@swin.edu.au](mailto:mswalwell@swin.edu.au)

## Abstract

This paper outlines a new funded project which aims to conserve and render born digital artefacts widely accessible by establishing an Australian Emulation Network. High value cultural collections from university archives and the GLAM sector requiring legacy computer environments will be targeted. The project expects to generate new knowledge across media arts, design, and architecture. Expected outcomes include stabilising and providing researchers with emulated access to born digital cultural artefacts, sharing legacy computer environments across the network, and establishing an Australian software preservation community of practice, building skills in preserving and emulating digital cultural artefacts with substantial future applications also in scientific preservation.

## Keywords

Media arts preservation; digital infrastructure; emulation; Emulation as a Service Infrastructure (EaaS); software preservation; digital preservation.

## Introduction

Australians were – and continue to be – significant contributors to the development of digital media arts, design, and architecture internationally. But our digital art and design history of the last thirty or more years is fragile and largely inaccessible to researchers at present, having only recently begun to make its way into cultural institutions and other archives. Such born digital artefacts constitute the record of how we became digital, from earliest endeavours right through to very recent history. The risk of losing this heritage material is real. This project will stabilise these collections so they are not lost, and make these digital creative and cultural artefacts accessible, through emulation. The physical media on which legacy digital objects are stored – whether magnetic or optical (i.e. floppy disks, CD-ROMs) – deteriorate over time. Obsolescence of computing environments is also a significant problem. Once computer hardware, operating systems and utility software become obsolete, files and other software dependent artefacts cannot be opened or run without digital preservation interventions. The solution to these twin problems involves the creation of disk images of obsolete media carriers, which can then be run under emulation. Emulation simulates the function of

obsolete systems and is a key digital preservation strategy for accessing content. These are now widely accepted solutions. For example, the British Library aims to image its entire disk collection, making it available to users in its Reading Rooms [1]. While not trivial, the two-part operation – imaging and making collections available through emulation – is eminently feasible. Realising the scale of the task, digital preservationists agree that international networked, collective action is a must [2], with CSIRO advising “Digital preservation urgently requires coordinated, national, cross-sector approaches to avoid losing access to historical digital materials” [3].

This project is rooted in both international collective action and national, cross-sector collaboration. We will join recent international infrastructure developments – notably the Emulation-as-a-Service Infrastructure platform (EaaS) – together with the learning that our team has gained from research and practice in disk imaging [4]–[6]. We will assemble ‘end-to-end’ software preservation infrastructure in Australian university and GLAM (Galleries, Libraries, Archives and Museums) institutions: this will enable an organisation that currently cannot access a file or an artwork to create disk images and emulate these in house.

## Disk Imaging and Emulation

The first part of the process involves creating disk images. Previous work has shown that disks that have not been kept in ideal circumstances fail at a higher rate to those stored in climate controlled conditions (61% to 94%), highlighting the perils that legacy collections with non-optimal storage histories face [4]. One Stanford study found optical media was failing at an alarming rate, with only an 8% success rate imaging CD-ROMs [7].

The second step is to emulate imaged content. Developed by computer scientists at Freiburg University, the Emulation-as-a-Service (EaaS) platform provides access to obsolete computer environments (hardware, operating systems (OSes)) enabling legacy software and other complex digital artefacts to be emulated and accessed by users in a web browser. The most developed emulation solution, EaaS is being used or evaluated at a number of institutions, including Rhizome, the Tate, the Canadian Centre for Architecture (CCA), and the Dutch Digital Heritage Network [8]–[11]. We are currently using it in Australia in two ARC Linkage Projects lead by the author –

“Play It Again: Preserving Australian videogame history of the 1990s” (LP180100104) and “Archiving Australian Media Arts: Towards a best practice method and national collection” (LP180100307) – where it has proven a very valuable tool for rendering the complex digital artefacts we are working with: 1990s games and 1980s and 90s digital media art. Funding from the Sloan and Mellon Foundations to Yale University has enabled a group of US university libraries to develop a networked version, called EaaS (EaaS Infrastructure). EaaS delivers a scalable emulation service, linking US libraries with born digital collections into a decentralised network where they can not only emulate content in house, but also share images of utility software and preconfigured legacy environments with other library nodes [12]. For instance, if a manuscript in one library requires an environment of Word 7 running in Windows 95, an administrator can search for and download the environment someone else has configured, saving time and resources.

Access to the EaaS platform is now being offered via a hosted pilot through the Software Preservation Network (SPN) [13]. This pilot brings together over 15 US university libraries and archives such as Yale, Harvard, Stanford and Cornell University, which will use EaaS to share configured environments. SPN is a membership organisation which our partners AARNet and the National Archives of Australia have joined, together with these North American organisations keen to access the hosted pilot. SPN’s pilot is similar to what we will build. A gateway provides computing power remotely, tracking users and environments and managing resources (RAM and CPUs) as needed, so that minimal IT resources are required from an organisation wanting to run EaaS in house. Controller computers are used by node administrators to build environments in EaaS’s backend, and users access emulated artefacts via a webpage [14]. Such a setup was envisaged by EaaS’s creators as early as 2014, when they wrote of “an EaaS service-provider [being] responsible for efficient hardware utilization and concentration of technical expertise...[lightening] the memory institutions’ technical workload and requirements on necessary infrastructure” [15].

## Network Participants and Aims

The project comprises universities (Swinburne University of Technology, RMIT, the University of Melbourne, University of South Australia, Western Sydney University, the University of Western Australia, and the University of New South Wales), National and State Libraries, other major cultural institutions (the Australian Centre for the Moving Image (ACMI), the Museum of Applied Arts and Sciences (MAAS), the Art Gallery of New South Wales (AGNSW), the Australian Institute for Aboriginal and Torres Strait Islander Studies (AIATSIS), and the National Archives of Australia (NAA)), software archives (the Australian Computer Museum Society), a research

technology provider (AARNet), and supporting overseas partners (Yale University, OpenSLX, Cornell University). This grand consortium is necessary as the market has failed to ensure that legacy content can be accessed, and most libraries and other archives in Australia lack the requisite infrastructure and know how. We propose to set up a network of fifteen university and GLAM sites across Australia. This will be a major national facility. Nodes will be located at the sites where digital creative and cultural collections are held. Setting up a network of organisations leverages collective effort and makes good financial sense [16]. The consortial approach builds on: existing networks such as the peak body National and State Libraries Australia (NSLA), collaborative work packages NSLA has undertaken [17], as well as previous projects in which Chief Investigators have been involved: Anna Munster and Sean Cubitt on “Reconsidering Australian Media Art History” (LP100200442) which produced the “Scanlines: Media Art in Australia since the 1960s” database [18], Harriet Edquist on “Design and Art Australia Online” (LE140100120), and Swalwell’s “Creative Micro-computing in Australia, 1976-92” Fellowship (FT130100391). Finally, the project directly benefits from the two aforementioned project collaborations involving installations of EaaS (at Swinburne, ACMI, AGNSW, and AARNet), and the specialist personnel associated (Dr Cynde Moya). The project has secured Australian Research Council LIEF (LE220100057) funding for infrastructure in the form of specialist expertise, vintage soft and hardware, cloud computing, storage, and tools to preserve, emulate, and share software resources across the nation, according to different organisations’ needs. The project will – through a combination of technical infrastructure and knowledge transfer – deliver software preservation and emulation capabilities across 6 of the 8 states and territories, with a high likelihood of future growth.

Joining together, we will build nationally significant digital heritage infrastructure, creating a network of technology, people, and emulation nodes seeded with legacy software and preserved content. Specifically, we aim to:

1. Stabilise at risk media arts and similar born digital cultural artefacts;
2. Deliver access to born digital cultural and artistic artefacts to researchers over an EaaS network;
3. Develop a Community of Practice (CoP) for software preservation in Australia, building skillsets and confidence in preserving and emulating digital artefacts.

## Targeted Collections

We will stabilise and emulate culturally significant media arts, architecture and design collections. We target at risk born digital creative and cultural collections across five key domains: (1) media arts; (2) architecture and industrial design; (3) games and apps; (4) AR/VR; and (5) web and pre-web networking. These digital collections constitute key research resources which CIs and their teams require access to. As Sean Cubitt and Oliver Grau wrote of media art in 2011: “As a result of rapid changes in technology, many

major works made even 10 years ago can no longer be shown or are disappearing without a trace. If this situation is not addressed, we face losing an art form that is a central part of our post-industrial digital culture. To date, systematic global preservation and documentation campaigns do not exist” [19]. Part of the Media Arts Histories conference series, the so called “Liverpool Declaration” received some 237 signatures from artists, theorists, and curators, internationally. Cubitt and Grau’s assessment holds equally for other domains. Content is either already inaccessible, often at risk of being lost, or fast becoming inaccessible.

While the collections we will work with are disparate, a decentralised network of organisations and collections is precisely what EaaS has been built to service. What these collections demonstrate is a new focus on distributed collections across the nation, similar to what is seen in the UK AHRC’s “Towards a National Collection: Opening UK heritage to the world,” attracting an £18.9 million investment [20]. The inter-relationships that will surface between the collections will be one of the most exciting aspects of the research that this infrastructure investment will enable. That diverse collections will be rendered accessible through a single platform should augment their usefulness to researchers.

### **Significance and Benefit**

Access to the abovementioned content will enable CIs and their teams to lead genuinely transformational research in born digital cultural histories, across the five domains. Few Australian researchers currently have access to born digital artefacts once computing environments become obsolete, unless they are running an emulation solution themselves. This means that scholars who are commenting on contemporary digital productions, for instance, are doing so without access to digital process or historical antecedents. Rendering these sources accessible will genuinely change what it means to undertake research. Rather than relying on second hand textual accounts or memory, researchers will be able to re-access historic titles or even previously out of reach design drawings, bringing new perspectives to historic and contemporary analyses. Emulation capabilities will generate new forms of evidence, citation – as has already started to happen in video game history [21] – and transformative methodologies. For e.g., architectural and design historians need new methodologies based in artefact analysis to account for the shift to digital design and modelling and the drift toward digital methods of documentation, from the mid-1990s.

We will build a technical and human network, training GLAM and university archival professionals with the skills they need so that the high value archival collections in their custody can be stabilised and rendered accessible. The project is premised on a conception of infrastructure as involving both people and technology. While the Australian GLAM sector has been developing digital preservation capacities, this has often targeted the ‘low hanging fruit’ of digitisation. Despite concerns about the greater fragility and

time criticality of stabilising born digital artefacts, progress has been much slower, particularly as regards software-dependent artefacts. These have often been placed in the ‘too hard basket,’ due to a lack of specialist skills and infrastructure. Each organisation is at a different stage of maturity in its ability to deal with complex born digital artefacts. We will train staff from nodes in universities and the cultural sector in how to create disk images where such training is required, or simply in how to build emulation environments in the EaaS backend. We will seed the development of a CoP by running web forums and seminars where practitioners can share their learning and ask questions, leveraging novel solutions to problems developed by those with more experience.

A Community of Practice will build confidence in the GLAM sector around born digital collecting. Existing GLAM infrastructure has not allowed for collecting or providing access to much of our contemporary digital heritage. This project establishes a CoP, which includes training in imaging and emulating such artefacts, as well as ongoing mutual support with the varied creative and technological challenges. This is critical professional development for the 2020s that will complement what is learnt in library and archival science and conservation degrees. The Australasia Preserves community is committed to the support of digital preservation strategies in Australian and New Zealand institutions, and recent activity indicates strong interest in an EaaS network across Australian institutions [22]. The establishment of such a specialist network will give our partner archives and others in the sector the confidence they need, making future collecting of digital design, including mobile applications, video games, social media, design and engineering documentation seem more feasible. This will in turn enable research into new forms of digital sociality and cultural production, such as app cultures and algorithms.

Deploying the EaaS platform enables legacy software and configured environments to be shared between nodes. Software products are both cultural artefacts worthy of study and enabling infrastructure for accessing digital content. Often, born digital files have been collected without the software required to open the files, or the operating system required for utility software to run. The process of building emulation environments is streamlined by the ability to share imaged software and configured environments. In addition, sharing effectively eliminates competition for purchasing scarce, second-hand software products. Emulation is now a viable strategy with a clear legal framework for use in Australian institutions. Recent changes to the Copyright Act (the “Research Exception”, in s 113J) permit a library or archive as defined in the Act to make research copies of copyright materials and to make these copies available to be accessed at the library or archive or another library or archive, provided certain conditions are met. Partners across the EaaS network will have access to a range of collections of utility software from sites including the Australian Computer Museum Society and the National Library of Australia.

CIs will further develop partnerships with others in the emulation field, for mutual benefit. Currently, Australian media art is probably being studied more in overseas contexts than at home. For instance, Dr Dene Grigar of the Electronic Literature Lab at Washington State University has hosted several artists to discuss and play their work. Dr Megan Heyward visited to make a “traversal” in 2019 – a technique of interviewing people with their artwork running on original hardware – and it was the first time she had been able to access “Of Day of Night” (1996) in almost twenty years. Video traversals constitute a useful form of documentation but they are imperfect as a method of preserving what are inherently interactive works. Not many of these labs are pursuing emulation, so they will likely find themselves unable to access work in the future. Cornell University is an exception. It has been one of the leaders in the US. Prof Timothy Murray wrote widely about and collected CD-ROM art when it was still contemporary, curating the Rose Goldsen Archive in the Cornell University Library; the Library developed a widely lauded online digital preservation tutorial; pioneered good practices in the archiving and emulation of digital media art in an NEH-funded preservation project [23]–[26]; now they are a participant in the SPN hosted pilot of EaaS. Norie Neumark is keen to explore international research and exhibition opportunities between the various Australian and US based collections. Similarly, the Canadian Center for Architecture (CCA) is working with Yale to implement EaaS into their access workflows for born-digital material, specifically building it into their access interface SCOPE. Gaining access to our born digital heritage content now will position Australian researchers to lead debates in our respective fields of historic media arts, born digital design and architecture, and what emulation means for them. Continued contact with other international leaders – such as the CCA and Cornell – will enable us to develop new collaborations, and put Australian artefacts in international context.

While many born digital artefacts are historic, this infrastructure is about the future as much as the past. Rapid obsolescence is making access to relatively recent VR works challenging. Digital work practices are now integral in fields such as architecture, and the future of practice in other fields is similarly digital, presenting challenges in archiving including establishing rationales for preservation, archiving processes and achieving digital continuity. Future historians are going to require access to much contemporary media (e.g. social media) in order to do their work. While digital connectivity has come to the fore during Covid-19 lockdowns and there has been some focus on rapid collecting in relation to the 2020 pandemic (e.g. at NAA’s “Documenting Covid-19 in Australia” (2020) symposium), born digital materials acquired now will need appropriate computing environments to remain accessible into the future.

The Emulation Network will span academic and GLAM institutions, leveraging existing network infrastructure operated by AARNet. CIs and their teams will either access EaaS within GLAM reading rooms on the premises, or on

university premises. Future copyright reforms that are anticipated but not yet enacted may enable organisations to offer remote access to authenticated users in the future [27].

Building software preservation and emulation infrastructure in Australia will have far reaching benefits for CIs, their teams, and the broader research community. While the project focuses on art and cultural domains, the technological and methodological development will have applications across all areas that use and need to study interactive systems. Inevitably, other software dependent collections and datasets will be identified at the universities and partner organisations which the infrastructure can be used to stabilise and emulate, including historical artefacts in education, social sciences and empirical data-rich science. This is in alignment with FAIR data principles, which emphasise that data should be Findable, Accessible, Interoperable, and Reusable [28] and will have important benefits for reproducible science, including software required to reproduce computationally dependent research results. Bodies such as OSF (Open Science Foundation) encourage the publication of complete research works – that is, an integrated set of data, analytical code, results and interpretation that can be re-run and modified at will by future readers and researchers. This clearly requires solving the same issues of long term change in hardware, OS and software that we are addressing in this project.

Stabilisation of obsolete storage media is an area of great need. Collections are at risk with the National Film and Sound Archive noting the “consensus among audiovisual archives internationally that we will not be able to support large-scale digitisation of magnetic media in the very near future. Tape that is not digitised by 2025 will in most cases be lost forever” [29]. Born digital components bring special preservation and access challenges: videotape degrades, magnetic computer disks suffer bit rot, computer hardware quickly becomes obsolete, and software dependencies present special access challenges. Time is of the essence if we are to prevent the loss of digital heritage, protecting the investment Australia has already made via arts funding. And as already noted, an emulation solution is not just needed for archiving the past, but increasingly for accessing recent scholarship, and for contemporary and future digital cultural collections.

Many organisations are grappling with how to develop a full production process for users who encounter content that requires emulation in their collections and need to use it for informational purposes. Yet few institutions have the infrastructure or skills to offer researchers access to born digital artefacts requiring emulation. This project’s focus on emulating obsolete software is identical to the needs of such users and readers. If we are to develop a capacity to safeguard digital collections in Australia, then we must work together, both across the sector and with those who have developed platforms internationally. We need to train a cohort of skilled people and support them with a CoP. We intend to do just that, giving the often professionally siloed GLAM professionals – archivists, librarians, and

conservators – a place where they can turn for help when they run into challenges.

Finally, EaaSII has the potential to complement and increase capability within other eResearch frameworks and institutional platforms, including in scientific and other research data management. This is in line with the international push towards open access, as journals and university repositories increasingly require deposit of research data that supports a thesis or publication.

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### **Author Biography**

Melanie Swalwell is Professor of Digital Media Heritage at Swinburne University of Technology. Her research focuses on the creation, use, preservation, and legacy of complex digital artefacts such as videogames and media artworks. Melanie is currently leading three digital heritage research projects: “Play It Again: Preserving Australian videogame history of the 1990s”; “Archiving Australian Media Arts: Towards a best practice method and national collection”; and “The Australian Emulation Network: Born Digital Cultural Collections Access”, funded by the Australian Research Council. An ARC Future Fellow from 2014-18, Melanie continues to research “Creative Micro-computing in Australia, 1976-92”. Melanie is the author of *Homebrew Gaming and the Beginnings of Vernacular Digitality* (MIT Press, 2021), editor of *Game History and the Local* (Palgrave, 2021), and co-editor of *Fans and Videogames: Histories, Fandom, Archives* (Routledge, 2017) and *The Pleasures of Computer Gaming: Essays on cultural history, theory and aesthetics* (McFarland, 2008).

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# Practicing Odin Teatret's Archives: virtual translations of embodied knowledge through archival practices

**Adriana La Selva, Ioulia Marouda**

Affiliation (s): Ghent University- S:PAM (Studies in Performing Arts and Media)  
and IPEM (Institute for Psychoacoustics and Electronic Art)

Location, country: Ghent, Belgium

Contact emails: [adrianaparente.laselva@ugent.be](mailto:adrianaparente.laselva@ugent.be), [ioulia.marouda@ugent.be](mailto:ioulia.marouda@ugent.be)

## Abstract

Informed by contemporary research in performance studies, this writing examines the ongoing challenges and possibilities of using XR technologies to create a virtual archive of embodied theatre techniques. This is part of a research project working with the (analogue) archive of Odin Teatret in Denmark, in which we are facing the challenge of transferring the embodied knowledge of actors' training into a virtual navigation system which evokes interaction and affect. We begin by outlining a critical epistemological framework which calls for new accounts of knowledge distribution and the place of embodied and affective praxis within this frame. We describe the process of having different training strands from practitioners of Odin and pupils being mapped with the use of motion capture technology. Further on, we approach one of the key aspects of this research, that of the translation of such embodied techniques and movement qualities into data and, consequently, into an immersive experience of archival navigation. With this paper we aim to contribute to the discussion on documentation of embodied knowledge in present times, one which calls for new approaches to practices of transmission, archive interaction and embodied navigation.

## Keywords

Embodied Knowledge, Virtual Archive, Body-as-Archive, Motion Capture, Translation, Theatre Anthropology, Epistemology, Document, Intangible Cultural Heritage.

## Introduction

This presentation draws on new approaches in Performance Studies concerned with the development of an epistemological framework for studying theatrical training techniques through archival reconfigurations in virtual reality. Whilst these writings are informed by an ongoing interdisciplinary research project, the aim is to investigate what it means to develop, practice and perform an archive through the activation of Odin Teatret's (DK) embodied

legacy in a virtual environment, addressing the translation of technique through immersive technology whilst developing dramaturgical approaches to archival practices.

Epistemology, a field of study traditionally linked to philosophy, has undergone substantial developments in the past few years, transitioning from a more traditional way of investigating a subject that knows singular with a focus on rational thought, paving the way for a more complex description of knowledge as "situated" [1] and "tacit" [2]. It has adopted theories that presuppose thought and cognition as "embodied" [3] and "enactive" [4], subject to, rather than disconnected from, emotion [5]. Following what Theodore Shatzki has called the practice turn, a notion that is linked to Performance Studies as much as to contemporary social theory, the concepts of knowledge and truth are mediated both by interactions between people and by arrangements in the world. Shatzki considers knowledge not as "the property of individuals, but rather a characteristic of groups, along with their material configurations" [6]. A contemporary archive of theatrical training, therefore, can no longer depend on a static system of representations: "Not only practical understanding, but ways of proceeding and even the configurations of the material environment represent forms of knowledge - it presupposes propositional knowledge and depends on them" [ibid.].

Embracing these ideas, we situate our epistemological account in relation to long-standing practices of work on the knowledge theory nexus in feminist, queer and other critical studies which include the articulation of identity and otherness as entangled matters [7,8,9,10,11]. Furthermore, we ask: what does it mean to account this entanglement as embodied knowledge in the context of a performer?

More recently, this framework has given voice to a growing demand from the performing arts field to document and analyse creative processes and techniques- which in an artist's vocabulary is called training- from an embodied perspective that connects the process of making, an artist's

poetics, to a broader social and political structure. As John Matthews notes, "Because of the specific problems presented by being a body-in-the-world today, training has achieved a new status as a global ideology" [12].

Moreover, the progress made in the fields of technology, information theory, computer modelling, and immersive multi-sensory displays bring the notion of the body-as-archive into a new perspective, especially with regard to theatrical techniques.

### **Praxical Agency, Technology, and Archive: Incorporating the Practices of Odin Teatret**

Odin Teatret is one of the oldest theater groups in the world, with a tradition of research in embodied practices for more than fifty years. The group is the main force of the broader artistic institution known as Nordisk TeaterLaboratorium (NTL) in Denmark, which today is also home to new generations who have built their artistic work in dialogue with Odin's legacy. Over these decades, Odin has built up an extensive archive that is a fundamental source of knowledge for creators, academic students, and theater researchers. This archive involves not only the written documents stored over the years of its long history, but also the codified physical training methods that the group developed to enhance the actor's bodily skills and presence.

A performer's praxis incorporates a series of embodied techniques, and as dance scholar Judith Hamera points out, technique is "the primary tool by which ideals are embodied or resisted"[13]. Thinking "the body-as-archive" [14,15] through the documentation of technical processes, we align with current concerns in the field of Cultural Heritage, where the notion of "document" is being rapidly transformed. Document "has become multimedia information, often even a dynamic form of information that is fully embedded in interactive systems" [16]. In this sense, the dissemination of information through documents has become fluid and volatile. We can argue that "the value of interactive multimedia culture tends to be based on experiences of interaction with interactive multimedia devices, rather than documents"[*ibid.*].

In this way, we follow the current discourse on archival practices by urging users and developers to reread history as a reconfiguration of documents, oral tales, and reconstructions through affective transmissions, where "architectures of access [...] place us in particular experiential relationships to knowledge"[17].

During this project, we are facing the challenge of designing a navigation system through virtual reality, allowing for an embedded embodiment to engage interactively and creatively with the archival material. One researcher in the field of Performance Studies focuses on the content of the archive, with particular attention for the embodied knowledge of Odin Teatre's performers and their trainings, and its translation into metadata. The other

researcher works in the field of computational modeling and virtual technology research and focuses on the design of the navigation system, finding solutions to inform interactive databases.

The challenge is to document actor training techniques in a digital and virtual manner, while allowing for a situated, personal approach, starting from the particular body-as-archive of every practitioner. Instead of focusing on only one Method, informed by the long actor training tradition of Odin Teatret, the interactive navigation design allows space for a genealogy of practitioners to unfold, including both Odin's performers and the new generations resident in their space. As such, the archive becomes a space to incorporate the tensions between subjective transmission and method-acting paradigms.

The body as a living archive is in perpetual modulation and hence not only stores but also creates and redefines the ontological nature of movement and performance into an enduring ephemerality – which corresponds to the changing position of the archive and memory in our digitized culture [18]. The interactive navigation system of the archive should hence not only be used to reconstruct embodied techniques, but also allow for interactive and creative transformation. The development of the navigational tool is informed by current dramaturgical and psychogeography strategies of drifting: a moving through the archive in an undirected way, in which the user charts its own course, however situated and organized by open systems.

On a very concrete level, the starting point are the returning principles developed by Eugenio Barba, the founder and director of Odin Teatret: a series of continuously elaborated concepts and techniques that structure a training. Barba considers the actor's craft in three meanings: he refers to 1) craft as technical skill; 2) as energy or kraft (strength, power in Norwegian); and 3) as the personal and professional identity, forged from technical skills and kraft. These three interrelated meanings are not elaborated from aesthetic or stylistic choices in different performance cultures, but from "pre-expressive scenic behaviors upon which the different genres, styles, roles, and personal or collective aspects of the traditions are all based" [19]. These recurring principles are: altered balance (an alteration of the daily technique of walking, of moving in space, and of keeping the body immobile, which leads to complex, seemingly superfluous 'luxury' balance), dynamic opposition (the way in which a performer's body is shaped by a myriad of micro-tensions between opposing intentional forces), consistent inconsistency (the ways in which scenic behaviour is consistent within the realm of theatrical practice, but inconsistent in terms of daily life), reduction (reducing the size of action in space whilst maintaining the energetic quality in time), equivalence (the building of scenic equivalents to daily behaviour), and actor's dramaturgy (the amalgamation of the pre-expressive principles in the actor's body-as-archive), and they are

investigated with precise reference to the metaphors and technical vocabulary of various performance traditions around the world by Barba [20]. They reside in written documents, audiovisual material, and, most importantly, in the body archive of practitioners.

Barba led an extremely interesting study about the use of energy within several theatrical traditions. He describes the importance of manipulating the energy that exists in any living body as the key to acquiring an extra-daily presence in a theatrical context:

“Every theatrical tradition has its own way of saying whether or not the performer functions as such for the spectator. This ‘functioning’ has many names: in the Occident, the most common is energy, life, or more simply, the performer’s presence. In Oriental theatrical traditions, other concepts are used [...], and one finds expressions like prana or shakti in India; koshi, ki-hai and yugen in Japan; chikara, taxu and bayu in Bali; kung-fu in China. [...] It is paradoxical that this elusive quality is arrived at by means of concrete and tangible exercises.” [21]

Because of the many words one can use to describe such presence, for the purpose of this paper, we will stick with the word quality.

### Navigation, affect and translation

In the past few months, we have begun with the process of motion capturing the practitioners involved in the project.

In this mapping of techniques, we are undertaking 4 strands of training inherent to Odin's tradition, and which are dealt with extensively in the current archive:

- Intersections between rhythm and commedia. Here the focus lies on rhythmical techniques that enlighten notions of rupture, dramaturgy, balance, improvisation and relation with objects.
- The Bridge of Winds vocal and energy work. The Bridge of Winds is an international theatre group, incorporated into the NTL and led by Odin Teatret's actress Iben Nagel Rasmussen. The group's training tools have been distilled in five different kinds of exercises. Each of these five exercises were devised to cultivate a specific working energy. The exercises evoke precise corporeal qualities from which the performers learn to draw their theatrical presence.
- Roberta Carreri's Dance of Intentions. This Odin Teatret's actress has developed a complex training process which focuses on an elaborated work of the spine and eyes to activate organic creative material. Her work draws on many masters of Japanese theatre traditions and in a key concept she calls *dynamic immobility*, which brings awareness to inner movements of one's body (Figures 1, 2).

- Vocal and breathing work. Here the focus lies on subtle corporeal layers engaged with vibration, resonators, and flow. Odin Teatret has built a consistent set of techniques to investigate this realm.



Figure 1. Roberta Carreri during her motion capture session, September 2021. ©Bruno Freire



Figure 2. Roberta Carreri and Patrick Campbell during their motion capture session, practicing one of Carreri's exercises called Pushing and Pulling, September 2021 © Bruno Freire

These strands of practices are mapped into data and performed several times, with intermissions for feedback on the capturing process, by 10 practitioners, both performers from Odin Teatret and long-term pupils of them, which throughout their own careers have incorporated and transformed the original practices, adapting them accordingly to situated cultural circumstances, professional careers and contemporary politics that have affected the theatre landscape. This collaboration reinforces therefore the genealogy of the practices investigated, starting from their creators reaching new generations.

When creating such an archive, new possibilities and challenges arise alike. The body of the performer, as well as that of the avatar, present and not present at the same time [22], encode the information within them in two parallel ways. The physical body carries the embodied knowledge in its materiality, while the virtual body holds patterns of

information which can change with the slightest tweak in the code. Thus, it is this translation of information from embodied to patterns of data and then to an experience, which will reintroduce the archive as an embodied experience, inevitably of another nature than the one first captured with the practitioners. We are called to translate corporeal energies into virtual forces, physical bodies into their abstracted virtual counterparts, from physical and vocal technique to metadata to an immersive textural architecture for navigating archives.

After an intense period of experiments with the data captured, we came to realize that the heart of this affective translation process lies indeed on the texture of the archive, the (virtual) space in-between the user and a practitioner's avatar. We have begun to design environments that can change one's movement quality, providing visual stimulus for interaction, allowing us to expand the digital topological analysis and description of actions into an affective and immersive experience to the user.

The interweaving of these textural formations builds the archive like a net: a fabric of lines, textures that make the materiality of this construction more "archi-textural than architectural" [23].

This term, following a tradition of critical thinking in geography and space studies, refers to

"[...] the communicative fabric that mediates between the structural properties of space and the spatial or communicative practices that (re)produce space." [24]

We are therefore, ultimately, aiming for a system which- inspired by Deleuze's ontology- will unfold space as a dynamic force, embedded in topological textures which articulate difference through interaction (Figure 3).



Figure 33. Environment interacting with performer's movement, from Roberta Carreri's exercise called Six states of Water, January 2022. © Ioulia Marouda

Aligned with Deleuze's enunciation that "difference in quality is always subtended by a spatial difference" [25], we argue that the articulation of these differences in one's inner processes can be produced by the encounter of the user with a designed environment. Encounters, from his

perspective, are generative and catalysts of processes of making sense [26], altering one's bodily qualities in similar fashion to the ways in which the recurring principles mentioned above are articulated to enhance a performer's presence.

In dealing with theatre techniques, one's interest and research lies in creating and codifying different *qualities* of moving which are filled with subtle intentions, intensities. In a few words, more than creating scores of movement, an actor looks for the inner processes within these scores. These inner processes have, naturally, an intrinsic relation to physical patterns of movement- slow, fast, strong, soft, etc.

From this context, we have begun to embrace Suely Rolnik's words:

"[...] asking about the politics of inventory becomes necessary since there are many ways to approach the artistic practices one wants to inventory. Such policies are distinguished less by the technical options that guide the production of an archive, and more by the poetic force that the proposed device itself is able to convey. I am referring to its aptitude to make the practices inventoried have the possibility of activating sensitive experiences in the present, necessarily different from those originally lived, but with the same critical density. Faced with this proposal, a question soon arises: what would a poetic inventory itself be like, that is, the production of an archive "for" and not "about" an artistic experience or its mere cataloguing, pretentiously objective?" [27]

As we are now, these designed virtual environments have become praxical territories that stimulate proprioception and kinesthesia, activated through the play between the (im)materialities of the virtual and the actual (Figure 4). As (author's name) has mentioned elsewhere: "The term praxical territory denotes the discipline-specific knowledge we each carry and its imbrication with our wider, lived subjective experience. This fusion of craft and life opens up a 'space and place' that reverberates with legacy and landscapes of mutual belongings." [28].

These new technologies we are playing with are becoming able to allow us to think processes of archiving differently. Not anymore as mere reproductions of what we suppose as truth, but as different translation systems which expose other logics to the process of acting upon knowledge. We begin to step away from the process of knowledge representation towards processes of techno-organic translations, which allows techne to be constantly actualized and re-assembled as models for praxis and transmission.



Figure 44. Environment interacting with performer's movement, from Roberta Carreri's exercise called Six states of Water, January 2022. © Ioulia Marouda

## Conclusion

We have shared in these writings an ongoing research process, which aims to nourish the pressing discussion in archive studies on how to account for the documentation of embodied knowledge and intangible cultural heritage. The demands of such a discussion in current times call for a careful rearticulation of the goals of the production of archives, bringing space for the experience of the encounter of a user with the living materiality of the documents archived to unfold into new ways of making sense of the embedded (embodied) knowledge displayed.

By elaborating on hybrids of both physical and virtual spaces, we allow a user to drift towards a new awareness of embodied knowledge transmission, production, and distribution, in which the freedom of a theatre laboratory provides the space for an interactive and creative encounter with codified artistic techniques and practices through virtual reality immersion. In this sense, the archive becomes a dramaturgical tool for the actor, dancer and performer, an 'architecture of access' to find one's way through the great amount of data available nowadays through lived experience. By treating archive/embodied heritage as an interactive tool where the main focus is on an interdisciplinary functionality of one's experience, this research gives voice to its potential on fostering innovative expressive communication.

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# Accessing and Displaying the Archive

Tabea Lurk, Jürgen Enge

Academy of Art and Design FHNW, University Library of Basel

Basel Switzerland

tabea.lurk@fhnw.ch, juergen.enge@unibas.ch

## Abstract

The pressure to open archives and cultural collections is increasing. Not only the Open-GLAM movement (Galleries, Libraries, Archives, Museums) demands easy access to freely usable sources. Civil society and even in-house interests (e.g., communication during the pandemic) point to a considerable need for action. This paper therefore considers two types of accessibility: individualized access for humans and ways of (automated) access for machines.

For interpersonal communication a curation tool for the exhibition context is presented that can be used quickly and is easily deliverable to different online and offline places. The automation aspect is structured according to the so-called FAIR-Principles. Here, too, a digital service is described that makes it easier for those archives and collections to become FAIR (Finable, Accessible, Interoperable, Reusable) and capable of (information) dialogues that would otherwise have to retrofit the existing systems.

## Keywords

Accessibility, Digital Curation, FAIR, Infrastructure.

## Introduction

The Corona pandemic (since 2019) has brought the digital dimension of cultural collections and archives to the attention of the general public. Digital accessibility has become a global object of desire. Even earlier, lively discussions about exhibiting and mediating digital assets, art and culture in digitally supported environments took place: literally merged c.f. in web-project “computer aided curation” (c@c by Eva Grubinger et al.), [12] solutions and creative approaches are discussed also by conferences such as ACM Creativity and Cognition and ACI Siggraph, Art.CHI, Ars Electronica, ISEA, Museums and the Web, to name a few. In addition, not to forget the abundance of curatorial and educational approaches in theory and practice. [2]

This lets us easy forget that most of the digital presentations or displays in house and online, which tend to accompany a tour in today’s museums or websites, are still developed, compiled, and made accessible on a case-by-Service, which is presented in the second part, we intend to shows that the path from a digital archive with basically inhouse access to a FAIR archive or repository, which

case basis - also for common, recurring formats. To put another way: most of the collections and/or archives that manage digital or digitized cultural assets are far from infrastructural solutions that would allow digital curation practices on a regular basis.

We are not talking about the exhibition of net art here, [1] nor about elaborate, digital mediation formats for specific events (audio-walks in the public space etc.) or any other type of interactive exhibition formats (exhibition/knowledge games cf.) or works of art [16] Rather, we are referring to those types of presentation where digitized/digital content changes from one exhibition to the next, but the way of presenting remains more or less the same in terms of formal aesthetics (cf. full screen display): cf. video exhibitions, where several works are played back one after the other, with or without subtitles or interstitials; slideshows with and without annotations; pdfs with flipping pages on a programmed basis; websites etc. Although many museums have Wi-Fi in the exhibition area, this content is usually brought to the displaying devices on digital data carriers such as USB-memory-sticks, instead of being programmed and played back directly from network based digital storage system. In the case of traveling exhibitions or interlibrary loans, files are sent around the globe.

In contrast to this time-consuming and resource-intensive approach, we will first present a web-based tool that facilitates online and offline exhibitions. The system enables updated or new curatorial display at remote places within seconds. We call the system *Info Screens* because it was developed in an academic art library for displaying archival content (as information) next to analog media such as books and journals: videoart and performance documentation, results of the practices-based final thesis of art and design students, reference material from teachers as well as research results, new acquisitions and special collections.

While the *Info Screens* support also displaying copyright-protected content in a (in terms of location and time) controlled digital environment, shielded from access by unauthorized persons or machines, with the so-called FAIR-provides the community with high-quality, trusted sources, is viable also for smaller cultural institutions.



Figure 1. Exhibition View of *Info Screens* (above) with schematic concept of main components (below).

## Info Screens

The *Info Screens* were specifically designed for the exhibition context. They consist of three components (see fig. 1 – left to right):

- *Controllers*: which ensure the correct data being displayed on the right screen/client at the right time.
- A *Proxy*: which regulates the communication between all devices. The *proxy* guarantees that data security is given - especially in the case of copyright-protected material.
- *Exhibition clients*: Computer with screens or beamer, etc.

All components are natively programmed in *Go*. [11] Since the code is freely available on *Github* [8] and can be updated with the respective playback content, the following explanations focus primarily on the technical structure.[9] From back, which means the *proxy* as data security (enabling communication), to front, in terms of the *clients* or playback, the *Info Screens* work as follows.

## Proxy

All clients and controllers establish an encrypted connection with the *proxy* and set up a virtual network. To ensure that the connection is secure, the logon of the clients is certificate-based. Every instance has its own certificate.

The virtual network supports different protocols:

- Via *gRPC* (a high performance *Remote Procedure Call* framework) the *controller* gives the clients display

commands and manages what's exactly shown right now or a defined moment in time (preprogrammed).

- Clients and controller can exchange data over the virtual network via *http://*. The clients do not have to be connected to the free and open internet; content can also be exchanged over a completely isolated LAN-network.
- The network time protocol *NTP* has been integrated into the virtual network via *gRPC*. This component enables the synchronization via an internal clock of the clients and thus allows to run animations over different clients (running text, distributed video snippets on varying screens, hand-over of video signals etc.).<sup>1</sup> Same can be applied to other media that are to be addressed in a synchronized, remote way.

Furthermore, the proxy saves the status of the different clients. Thus, they automatically receive the same content any time they connect. This feature is especially useful if you have setup the devices in a way, that they automatically start up in the morning or after a power interruption: As soon as there is power on (again), they reset in a predefined way. The *exhibition clients* register themselves with the *proxy* and receive (once again) the information/data – automatically, without any human intervention.

## Controllers

The *controllers* have two interfaces: a *web-based frontend* and a so-called REST (REpresentational State Transfer) API (see fig. 2):

- The *web frontend* allows addressing the screens remotely and individually. Beyond programming and automation, the clients can thus spontaneously be updated with (remote) information such as e.g.

<sup>1</sup> An artistic example in which different screens are partly covered with videographic images and image-excerpts would be Alexander Hahn's sculpture at the building project "Home of IT" for Roche

(Kaiseraugst, CH). [13] Even if this system has nothing to do our *Info Screens* described here, it shows the creative potential of multiple remotely and synchronized controlled screens.

welcome message for specific guests or emergency information).

- The REST-API enables automation.

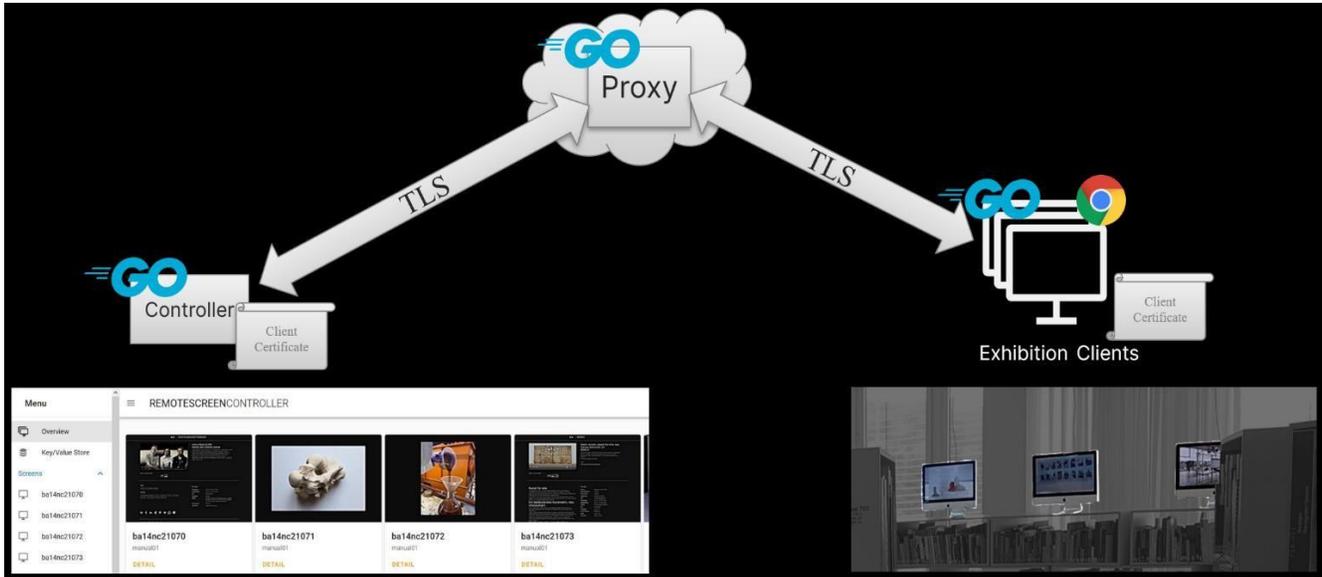


Figure 2. Info Screen Network Communication.

The *web interface* contains furthermore a screenshots option, which might remind one of classic light desks for slides (see fig. 3). It allows to create a screenshot of all running clients at the push of a button. The images represent the content being displayed at the same time, in real time at the exhibition floor.

Supported by the debugging protocol of the Chrome browser (see below), the feature is very handy to find errors or to check, if all clients are really booted automatically, e.g. in the morning.

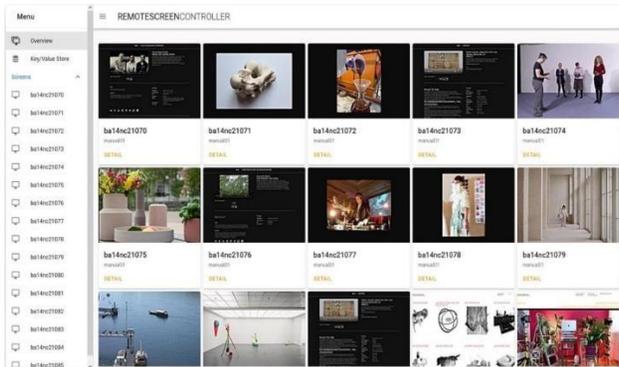


Figure 3. Web interface of controller.

The content to be displayed at the *exhibition clients* is put together in so-called *controller scripts*, which are also delivered to the *exhibition clients* by the *proxy*. These scripts contain the respective configurations, kept in json-files.

Before going more into detail about the curation process (of configuration) and how the *exhibition clients* are actually equipped with content, it is worth to take a quick look at the *exhibition clients*.

### Exhibition Clients

For ecological reasons, we use old Macs computers as *exhibition clients*, which were to be discarded. Because they do not have to be connected to the internet and are shielded from the common security risk areas that present vulnerabilities, it is possible to keep outdated computers up running until they die. We have simply replaced the original hard disks with more robust flash drives and installed an image that allows, for example, the automated startup and shutdown of the computers and maintenance for all in exactly the same manner.

Beyond concrete curatorial or displaying concerns, for our context at least, it is only important that a current *Google Chrome* browser is installed on the machine(s) used. Google Chrome was chosen (as displaying App) due to the above-mentioned remote-control option.

We use the browser in its full-screen mode. That's basically all the clients require. Furthermore, if e. g. video or other content with sound is displayed, deactivating the sound might be a good idea in different situations.

Last but not least: Using a current browser furthermore saves programming effort and guarantees that common data formats are displayed correctly.

### Digital Curation of Content

The only thing that remains regarding the *Info Screens* is how the content is to be arranged and played out. For the

sake of simplicity, we refer to the process of selecting and assembling digitized content (data) as “curation action”. Here two types of scripts are needed:

- *Controller scripts* contain the target URLs of the digitized content (images, videos, PDFs, web pages etc.).
- *Media templates* provide the functionality for displaying the different media formats.

Since the structure of the scripts is more or less the same, it seems sufficient to comment on the existing samples, which oriented to the needs of the <institution>. We use currently most of the time media templates with one for each type of media. In addition to these templates for a) slideshows (timed image sequence), b) video exhibitions, c) PDF and d) web pages, combined templates as well as those for other/future formats may be implemented.

All exhibition data must be in an online addressable form – following called *MasterURL*. Once a client receives a dedicated *exhibition file* (.json), it plays this very same script until it receives the command for a new exhibition file. Within this exhibition file all information is listed one after the other (see fig. 4).

```
1 {
2   "title": "Art Exhibition 2015",
3   "wsAddr": "ws://localhost:443/ws",
4   "delay": 10,
5   "images": [
6     {"masterurl": "diplomhgkfhmw.ch/wp-[...]_01/resize/size1920x1080"},
7     {"masterurl": "diplomhgkfhmw.ch/wp-[...]_13/resize/size1920x1080"},
8     {"masterurl": "diplomhgkfhmw.ch/wp-[...]_23/resize/size1920x1080"},
9     ]
10  {"masterurl": "diplomhgkfhmw.ch/2015/wp-[...]_85/resize/size1920x1080"}
11  ]
12 }
```

Figure 4. Excerpt of *media template* data for a slideshow.

It is possible to specify contextual information such as the duration of display for the images, overlaying metadata information (such as title, author, date etc.), QR codes, logos for example. The information can be defined for all files in the same way or individually for each *MasterURL* – depending on specific requirements or institutional guidelines.

Fig. 4 shows, for example, a simple slideshow: starting with the displaying information for all images and a duration of 10 seconds, type of script (here: images). In the following area where the *MasterURLs* are presented, you find a command to adjust all images on the fly to fit the display size with <resize>. Defining the background color or image, specific frame-layouts etc. is also possible.

Regarding videos exhibits, one might define starting point or max length (duration) of a file for display. For example, if you don't want to play the whole video, but only a short ‘appetizer’ sequence of 150 seconds starting at second 620, this can be defined within the (json-based) exhibition file.

In case of PDF-data, we always display a QR code so that viewers can download the source and read it at their leisure on their mobile device, for example. And we flip pages after 10 seconds, which can be adjusted, too.

The handling is therefore very simple and virtually self-explanatory. Only the layout of the *MasterURLs* must be converted from backslashes to ‘backslash-slashes’ combinations to support the JSON syntax. If the system is

used more widely, this operation should be automated - using Excel for example or other scripting tools.

Since the software used does not need to be purchased or trained in a complex way, freelance curators or, in our case, students and teachers can put together their own exhibition programs and then have them played automatically on devices that have a current browser - without these devices having to have particularly large memory capacities.

## FAIR-Service

Moving from the *Info Screens* to the *FAIR-Service*, a) automation and b) aspects such as institutionalization of services in terms of infrastructural solutions build a common ground. Main concerns of the FAIR-Service become clear by breaking up of the acronym of FAIRness: FAIR actions support the improvement of the *Findability* of (re-)sources, *Accessibility* (in terms of documented availability, including access status), *Interoperability* (for automatized exchange of information) and *Reusability* (by clearly described copyright or license information).

Though the FAIR-Principles [10] were developed in an academic environment to facilitate automatized scientific communication, [4] and exhibition institutions and archive occasionally pursue slightly different interests than science, the FAIR-specification seem fruitful also to curatorial concerns – especially when openness becomes a strategic goal. Skipping strategic issues and concerns regarding the quality of (semantic) metadata, [3] *the FAIR-Service* offers help when decisions have already been made and technical solutions for fulfilling core requirements are need. Within this situation we face three technological gaps, current archives often suffer of:

- provision of so-called *persistent identifiers* (PID), including associated re-direct services (FAIR:F1),
- *OAI-PMH* interfaces for automatized information exchange (FAIR:A1.1), and
- documentation of *deletions* (FAIR:A2).

The following considerations focus on implementation issues such as the database behind the service (*FAIR-DB*), metadata mapping, persistent identifiers, redirection and multi-client capability. Beyond that, FAIR databases or (data-)systems should ensure authentication and authorization (FAIR:A1.2). Regarding further requirements for trustworthy archives see e. g. references [3] [5].

## FAIR-DB

Technically speaking, our *FAIR-Service* consists of a small database (PostgreSQL), which we call *FAIR-DB*. This database contains the metadata of the *source* system (archive or collection management database). In addition, it holds an intermediary metadata schema, which allows the conversion of the existing metadata structure to the *target* schemata, which are delivered via the OAI-PMH interface. Even though the target schema can theoretically be defined by the hosting institution, the OAI-PMH interfaces are

usually based on a standard implementation of the core fields of Dublin Core. [7]

The *FAIR-DB* is also able to manage different data sets. This allows grouping of items for selective harvesting. Defining access to subsets is relevant, if data (of an archive) is not to be made accessible as a whole but in dedicated, e. g. curated groups or collections.

If the *source* metadata system of the archive or collection gets lost or is temporarily out of service, the *FAIR-Service* displays the stored metadata information of the *FAIR-DB* on its own web interface or website. Even though this web page delivers rather rudimentary metadata information, since very often only part of the source metadata is made publicly available, the system guarantees continuous access.

## Metadata Mapping

Taking a closer look at the metadata of the *source* database systems, the FAIR specifications reveal common gaps. This seems natural as these systems and their primary purpose focus different interests: Collection management systems facilitate for example interinstitutional loans. Long-term

**Findable**  
The first step in (re)using data is to find them. Metadata and data should be easy to find for both humans and computers. Machine-readable metadata are essential for automatic discovery of datasets and services, so this is an essential component of the FAIRification process.

- F1. (Meta)data are assigned a globally unique and persistent identifier
- F2. Data are described with rich metadata (defined by R1 below)
- F3. Metadata clearly and explicitly include the identifier of the data they describe
- F4. (Meta)data are registered or indexed in a searchable resource

**Accessible**  
Once the user finds the required data, she/he/they need to know how can they be accessed, possibly including authentication and authorisation.

- A1. (Meta)data are retrievable by their identifier using a standardised communications protocol
  - A1.1 The protocol is open, free, and universally implementable
  - A1.2 The protocol allows for an authentication and authorisation procedure, where necessary
- A2. Metadata are accessible, even when the data are no longer available

**Interoperable**  
The data usually need to be integrated with other data. In addition, the data need to interoperate with applications or workflows for analysis, storage, and processing.

- I1. (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
- I2. (Meta)data use vocabularies that follow FAIR principles
- I3. (Meta)data include qualified references to other (meta)data

**Reusable**  
The ultimate goal of FAIR is to optimise the reuse of data. To achieve this, metadata and data should be well-described so that they can be replicated and/or combined in different settings.

- R1. (Meta)data are richly described with a plurality of accurate and relevant attributes
  - R1.1. (Meta)data are released with a clear and accessible data usage license
  - R1.2. (Meta)data are associated with detailed provenance
  - R1.3. (Meta)data meet domain-relevant community standards

Legend: Catalogue (orange), Fair Service (blue)

Figure 5. Schematic representation of how FAIR specifications are covered by common database systems.

archiving or preservation systems enable (among other things) monitoring of data consistency and integrity by (re-)calculating checksums on a regular base, etc.. Neither have open, machine-readable exchange options for information as a dedicated or primary aim. Even though the

<sup>2</sup> A study on scientific open collections was presented by Beer, for example. [16]

situation is different at each institution, one can see that many metadata systems do not natively meet all FAIR-specifications – even in the context scientific special collections [17].

Fig. 5 shows a schematized view on this topic, based on our own experience. It lists the FAIR-specifications by highlighting dedicated requirements. While the red layer indicates information that is usually provided by the *source* database systems, the blue one represents additional needs that are provided by the *FAIR-Service*: Features include persistent identifiers, references to the applied access protocols (e.g. for OAI-PMH), norm-data, open and freely available interfaces etc.

The extent of supplements depends on the institutional set-up or starting position.<sup>2</sup> With regard to the FAIRness of a collection or archive, the accessibility of the metadata schema and its compliance with common standards play, among other things, a certain role. Therefore, wherever available, vocabularies and/or thesauri used should be accessible. Furthermore standardized (meta-)data such as authority data facilitates communication.

## Persistent Identification of Records

Due to the spreading, the *FAIR-Service* generates automatically Handles as default *persistent identifier*. This happens automatically when data is declared as FAIR in the source system in order to guarantee persistence.

Via the *editorial interface* of the *FAIR-Service*, DOIs (Digital Object Identifier) can be generated manually in addition to Handle. This might be of interest when data is dedicated as publication or content shall be (re-)published. Even though one might generate DOI automatically, like many publication servers, we prefer the manual operation due to cost reasons. Not all FAIR-data really required DOI as identifier.

Furthermore sometimes DOIs must be reserved before the completion of a publication: e.g. when the DOI is to be integrated in the imprint of an exhibition catalogue. However, activation/release is only allowed by DataCite when the final publication is indeed available.

While DOI is used in the scientific context mainly for identifying publications (especially articles, text-based resources or more recently data publications), Handle is less restrictive. It is the technical basis for DOI and can be applied for dynamic data objects, allowing updates, growing resources etc. In contrast to DOI, Handle can be assigned by the respective institutions after registration in a cost-neutral manner. If DOI is to be supplied, a mapping to the DataCite metadata schema should be granted, too. [6]

## Redirection

Offering PIDs means also to guarantee access even if files are relocated at a server. The *FAIR-Service* therefore contains a *redirector* service.

The *redirector* points to the referenced record in the source data-management system. In our case, the result ends up in a record of the collection catalog, which aggregates content from different sources (databases).

Redirection services as intermediate layer are useful for institutions that have more than one database (e.g. different Filemaker databases or database instances). Providing a common, searchable data view, which is based on a defined (e.g. full-text) index, follows FAIR:F4 specification requirement.

In addition, the *redirector* plays an important role regarding the documentation of *deletions*: In case of deletion, data records should not just disappear. FAIR means that it must be indicated that the data once existed and is for example no longer available.

## Multi-Client Capability

The *FAIR-Service* can manage virtual instances. Within the academic context this feature supports universities to provide different repositories or data sets according to the respective disciplinary target communities, layout, expectations of appearance etc..

The virtual instances are neatly classified and grouped by the dedicated area of interest.

For smaller archives or cultural institutions, this feature support inter-institutional cooperation. Institutions, which do not want to or cannot afford providing an own OAI-PMH interface, may join forces regarding the *FAIR-Service*, by staying perceived completely independent from the public.

## Perspective

If *FAIR-Service* is used as source or delivery system for the formerly introduced *Info Screen* system, exhibitions can be almost automatically assembled. This happens due to the common metadata format used and supported by the *FAIR-Service*.

In this case, a *controller* script and *template* is developed in which nothing but the internal IDs or Handle/DOI-part of the source is referenced (rather than the entire masterURLs). The script address then the respective master directly. Of course this seems suitable only for items with a clearly identifiable, master media object.

## Summary

Summing up this paper, one might state that the *Info Screens* and the *FAIR-Service* represent two opposite sides of the archiving coin of the future: while the *Info Screens* rather face curators or collection-based needs, the *FAIR-Service* directs towards a digital public, which is not necessarily known any more.

By presenting different types of accessibility, both tools direct online archiving towards a new direction in that curation and access are transformed from case-specific, one-by-one solution to an infrastructurally level of automatization and sustainable archival routines.

We are regarding infrastructures as a set of fundamental facilities, systems and features, that support a durable and continuous functionality of an institution. This perspective helps to simplify recurring workflows for archival playback of content and for reaching out to common public requests.

While selection of content and decision making remain subject of everyday curatorial work, the *Info Screen* system shortens, metaphorically speaking, the way from desk to the exhibition space. By doing so, it eases a) the digital display of archival content, b) supports safeguarding resources (Wi-Fi) and c) secures data provision as compared analogue procedures such as copy-paste data carrier solutions.

The fact that all exhibition screens in the building may display important messages in an emergency case – at the click of a mouse – can d) provide a important surplus effect.

FAIR services, instead, and the specific tool in particular increases visibility and outreach of data by presenting a concept of free and open access to data. Following the headline topic of the Danish Open GLAM conference “Sharing is Caring”, [15] one can identify in FAIRness a key element for enabling and promoting access, interest, relevance and impact of cultural assets for the long term.

That this view has long since ceased to be a secret, is illustrated, among other things, by the Open Glam Survey by McCarthy and Wallace, which is continued since 2018 [14]: More and more collections and archives are moving into the public arena and thus create options for cultural participation,

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## **Authors Biographies**

Tabea Lurk hold a PhD in art history & media theory and a master in library & information science. Since August 2015 she has headed the media library of the HGK FHNW. From 2006-2015 she worked as a lecturer for digital preservation at the Academy of the Arts (BUA) BFH Bern. Between 2008 and 2015 she headed the ArtLab (BUA) which functioned as an interface between the humanities and natural sciences. In 2012 she established the Master of Advances Studies (MAS) in Preservation of Digital Art and Cultural Heritage. Main areas of work: Access to digital information; information literacy; data management in the context of art, design and artistic research; digital archiving.

Jürgen Enge is a computer scientist and head of the IT department at Basel University Library. Previously, he worked at the Academy of Art and Design FHNW Basel, the University of Applied Sciences and Art in Hildesheim, Holzminden und Göttingen (HAWK), the Zurich University of Art, Bern University of the Arts, University of Design (HfG) and Center for Art and Media at Karlsruhe. He has always been interested in the interplay between art, technology and society. He has built extensive and specialized data management and archiving systems. In addition, he has developed countless websites and digital tools that enable (automatized) indexing, sustainability and FAIR access and preservation of cultural digital sources and data. The services described above originate from him. Main areas of work: digital archiving; data & system development; digital communication; information infrastructures.

# *Stayin' Alive. Southern Cone Video Art Archives in Context*

**Alejandra Crescentino**

Universidad Autónoma de Madrid  
Madrid, Spain  
alejandra.crescentino@uam.es

## **Abstract**

This presentation addresses some problems affecting physical and digital archives dedicated to video art in the Southern Cone, relating to matters of accessibility, preservation and dissemination of video-based art collections in the present. In an attempt to map such a complex situation, firstly, I look at some of the most relevant Latin American video art festivals. I take as case studies the Encuentros Latinoamericanos de Video, the Festivales Franco-Chilenos and Franco Latinoamericanos de video arte, VideoBrasil and Buenos Aires Video, which promoted the production, circulation and dissemination of audiovisual arts in the last two decades of the 20th century and, alongside, fostered the creation of physical archives or video libraries in the region. Secondly, I identify some institutional and academic projects that, since the mid-2000s, have carried out tasks of valorization and remediation of video-based art collections. Actions through which it has been possible to give visibility, accessibility and survival to some video art works, and documentation related to the above-mentioned festivals. Finally, under the premise of problematizing the initiatives that safeguard this audiovisual culture and its difficulties to endurance, I point out common challenges to audiovisual archives in the present, and the answers articulated by some research projects to face them

## **Keywords**

Video Art, Video Art Festivals, Audiovisual Archives, Obsolescence, Remediation Projects, Southern Cone.

## **Introduction**

The purpose of this presentation is to reflect on some challenges affecting physical and digital archives dedicated to video art in the Southern Cone in the present. In order to give rise to this discussion, I will refer to some relevant Latin American video art festivals that fostered the production, circulation and dissemination of audiovisual arts in the last two decades of the twentieth century and, alongside, fostered the creation of physical archives or video libraries in the region. Secondly, I will explain some institutional and academic projects that, since the middle of the year 2000, have carried out tasks of valorization and remediation of video-based art collections

Regarding methodological aspects, this approach is based on classical sources (bibliographic and documentary) and electronic sources (websites, databases, online archives, research project platforms, etc.). Likewise, Documentary Resources Centers and Archives in Chile, Argentina and Spain have been personally consulted. The unfeasibility of completing a comprehensive study of all the institutions and archives dedicated to video art in the Southern Cone, it made necessary to establish a cut that would allow a more concrete approach to the subject. To this end, we focused on some archives and projects linked to five pioneer video art festivals in the region: the Encuentros Latinoamericanos de Video, Festivales Franco-Chilenos and Franco-Latinoamericanos de Video, VideoBrasil and Buenos Aires Video.

The examined academic-institutional projects propose possible ways to remediate and give visibility to video based-arts and physical archives related to those festivals.

In relation to the general frame of reference, the theoretical contributions of the New Media field offer conceptual tools that are appropriate for our approach. On the one hand, we ascribe to the notion of remediation proposed by Bolter and Grusin [1], which alludes to the power of digital media to remediate old media through a process of refashioning or transcoding [2]. This argument allows us to conceive of today's institutional digital archives and repositories as refashioned extensions of physical archives and video based-art libraries. After the advent of the digital world, new hypermedia platforms have emerged—some of them with no basis in pre-existing physical spaces—that also operate under this logic: remediating old audiovisual media works and offering hypermedia content.

On the other hand, this approach considers critical and theoretical contributions dedicated to explore the crossings between institutions and new technologies, and the role of these technologies in the dissemination of cultural heritage. Perspectives that address the impact of digitalization and globalization processes in the field of contemporary cultural creation, transforming artistic practices and the material and institutional apparatus in which they are inserted [3],[4].

In relation to the above, Argentine researcher Jorge La Ferla identified several difficulties linked to the absence of

comprehensive collections to trace a memory of the audiovisual arts in Latin America. In his reflections on “Por una praxis de archivo para las artes tecnológicas experimentales en América Latina”, he pointed out very relevant issues regarding the circulation and preservation of audiovisual works. Among them, the scarcity of public and private projects aimed at the creation of panoramic institutional archives in the region. He also alluded to the fundamental role played by some traveling video and experimental film exhibitions in the creation of archives, the theoretical reconstruction and the material recovery of pieces that were thought to be lost. He stressed that, in the absence of consistent public policies for heritage protection in the Southern Cone, some institutions and agents had taken on the task of preserving and updating technological works that would otherwise remain inaccessible. Finally, there was another set of difficulties in relation to existing collections. Among them, the undefined heritage status of the pieces incorporated into the institutions, the fragmentary nature of these heritages and, as a consequence, the difficulty of making interpretative readings of the whole [5], [6]. These observations, made more than a decade ago, constitute a starting point to offer a re-reading of these issues in relation to the Video Art archives of the present.

### **Festivals and Video Art Archives in the Southern Cone: Legacies of the Past**

It is necessary to look back, at events that took place and archives that were created in the past, in order to understand the current state of the institutional physical archives holding videographic works in analogue media.

The use of video as a support and means of artistic creation date back to the early seventies, linked to a few institutions. Among them, the Centro de Artes y Comunicación (CAYC) in Buenos Aires, and the Museu de Arte Contemporânea at the Universidade de São Paulo (MAC-USP), with paradigmatic trajectories in this regard. Both entities provided the artists with porta-pack equipment, thus encouraging experimentation through new technologies. Under the direction of Jorge Glusberg, the CAYC became one of the first institutions in the region to organize international video exhibitions and to promote videographic production. Unfortunately, none of the works exhibited, nor those produced by the CAYC, have survived to the present day. As Alonso emphasizes, this was due to the high cost of these new technologies, which made it difficult to keep backup copies [7]. Under the management of Walter Zanini, the MAC USP also occupied a pioneering role by creating a Video Sector and a room dedicated exclusively to video programming - the Espaço B - in 1977. In recent years, a research project headed by Roberto Moreira S. Cruz addressed the study of this space. During 2020, part of his research was reflected in “VÍdeo\_MAC”,

<sup>1</sup> Among others: library of Museo Nacional de Bellas Artes de Chile; the Chilean documentation center CEDOC; the CC Ricardo Rojas Archive of Universidad de Buenos Aires (CCRR-UBA), the

an on line exhibition of great patrimonial and documentary value, since it allowed to know Brazilian productions in this support totally ignored until now [8].

However, beyond these specific examples, video did not achieve a significant presence until the eighties, when some institutions in the Southern Cone held festivals and generated collections dedicated to video art. As La Ferla pointed out, the proliferation of video festivals during this period was a major factor in the creation of audiovisual archives. Likewise, video libraries became highly appreciated as they offered the possibility to consult audiovisual materials in different magnetic or optical formats. In such places, the copies of the works participating in the festivals were juxtaposed with records of activities carried out by the institution and videographic works of international referents.

Of course, video art flourishing coincided with a process of gradual growth in the number of users of the electromagnetic media, closely linked to the expansion of mass media and new technologies by transnational capital. Logically, such circumstances had an impact on the art world, and by the middle of the decade, video-based art had entered — albeit timidly — in various institutional spaces through viewings, conferences and meetings, largely promoted by artists, producers and independent filmmakers. An illustrative case of such convergence is the Encuentro Latinoamericano de Video (1988-1993), promoted by independent producers from all over Latin America. Among the hundreds of associations and collectives at the forefront of these meetings was the Centro de Medios Audiovisuales (CEMA), an Uruguayan production company that stood out for its extensive audiovisual work. For this reason, it became the subject of an academic research project, which will be referred to later in this paper.

Video art also grew as an autonomous artistic discipline, supported by an international circuit specialized on video art. Thanks to the support of foreign financing agencies, especially those of the French and the Spanish Cooperation, numerous festivals, exhibitions and awards were created and organized. These articulations strengthened existing regional ties and stimulated production and reflection on video art in the Southern Cone.

Examples of these initiatives are the Festival Franco-Chileno de Video Arte (1981-1994) and the Festival Franco-Latinoamericano de Video Arte (1992-1996), which were consolidated thanks to the support provided by the French Ministry of Foreign Affairs and the participation of numerous local institutions. For more than a decade, Santiago de Chile was the capital of an event that attracted the attention of its southern neighbours. In the early 1990s, the festival expanded its regional scope to become a multi-site event that spread to Argentina, Uruguay, Brazil and Colombia. As a result projected to the present, each participating institutions<sup>1</sup> formed a partial collection of the

Colombian National Library and the Information Center of Museu da Imagem e do Som (MIS) in São Paulo.

same, safeguarding videographic pieces, vestiges and/or documentary sources.

In Brazil, the precursor in this field was VideoBrasil festival (1983-Present). Celebrated at first at the Museu da Imagem e do Som (MIS), later editions were organized by the Associação Cultural Videobrasil together with the Serviço Social do Comércio (SeSC). Starting in the 1990s, the festival declared the expansion of its sphere of action to the entire geopolitical South and founded the association to house an increasingly broad heritage of documentation, publications and video based-art collections. Thanks to its institutional policy and the direction of Solange Farkas, the task developed by this entity has gained a great value, and is unparalleled by other similar associations within Brazil or in the Southern Cone [9].

Also in the late eighties, the Buenos Aires Video festival (1989-2001) was organized at the Spanish Cultural Center of the Instituto de Cooperación Iberoamericana (ICI-AECID) in Buenos Aires. The first editions, curated by Carlos Trilnick, were held under the exhibition format proposing a local videographic panorama. From the sixth edition onwards, the festival became competitive and included selections from other countries, which stimulated the circulation of Argentine productions in the region. From the very beginning, the institution created a video library with equipment for on-site consultation. Its collection, dedicated to Spanish, Argentine and Latin American video art, was gradually enlarged with the entry of works selected by Buenos Aires Video. However, after the digital shift, both the festival and the video library ended their task, and the latter ceased to be accessible to the public [10]. The advent of digital, networked and globalized culture decisively modified the ways of using and accessing information. With the “passage to the world of screens”, there was a dizzying cultural leap that changed the register of everyday life and mediatized life [11]

Thus began a gradual process of institutional computerization, in which computer tools became allies in the documentary management of archives and collections, displacing analog systems and technologies. In the case of video libraries and audiovisual archives, equipped with analog technologies and devices, this transformation led to their deactivation as reference spaces and their consultation materials became “archaeological objects”. Although many institutions have preserved these collections (mostly composed of U-matic, VHS, Betamax, Betacam, among the most popular ones), very few have undertaken a process of digitization.

On the other hand, the digital turn had an impact on the ways of looking at and thinking about the phenomenon of regional video art. There was a shift from the narratives of the national scenes, delineated by events during the eighties and nineties, to the construction of narratives from the local scenes connected and immersed in the global map of the networked world. Some institutions began to post a large amount of content and communicate activities on their institutional websites. Simultaneously, new research projects began to explore the dispersed paths of the art-

technology relationship in the Southern Cone, under a format of associative work between institution and academia.

Due to this interest, a significant number of platforms dedicated to regional video art began to emerge in the mid-2000s. Such hypermedia linked to academic and institutional projects and articulated as online archives or databases, have formulated new readings on Latin American video art. On occasions, they have also been accompanied by exhibition and editorial proposals aimed at giving visibility to works in now extinct formats.

**Remediation of the analog past** As Bolter and Grusin have pointed out, the search for intermediation runs through the entire history of media development in the West. Immersed in this logic, the new media have expanded this capacity for mediation thanks to their power to incorporate almost all of the previous supports and technologies. To allude to this media agentiality, the authors have proposed to understand the notion of “remediation” as “reform” and as “repair” of other media [12]. Thus, remediation can be understood in two ways. On the one hand, as a form of mediation of a prior media, an intermediation. On the other hand, as a repair, a way of preventing a danger, in this case, the disappearance of works born under formats that become obsolete.

In the case of analogical archives, these “remediation” have been articulated from valuable research projects that rescue from obsolescence or invisibility a part of those audiovisual archives linked to the path of festivals and institutions proposed above. One aspect to be emphasized is that all these developments not only propose the digital remediation of analog audiovisual or documentary contents, but also actions to revitalize these collections through publications, exhibitions, debates and viewings, among other activities.

One of the first to appear was the “U-MATIC” Chilean Audiovisual Heritage Project, headed by documentary filmmaker and researcher Germán Liñero. The initiative explored works made under this format in Chile between the years 1975 and 2000, including productions presented at the Festivales Franco-Chilenos and Franco-Latinoamericanos and the Encuentros Latinoamericanos de Video, among others. The results of this research were articulated in three axes: the materialization of the “U-MATIC Exhibition”, held at the Museo de Arte Contemporáneo of Santiago de Chile in 2005; the publication of the book *Apuntes para una Historia del Video en Chile*, in 2010 [13]; and the creation of a website. The latter (now defunct) exhibited digitized fragments of more than twenty selected audiovisual pieces, and more than four hundred technical files of titles with reviews of their authors.

In 2015, the Chilean and Argentinean collections of the Festivales Franco-Chilenos and Franco-Latinoamericanos revitalized thanks to the donation made by Pascal-Emmanuel Gallet, the French cultural attaché and promoter of the festivals. This legacy generated revisions and a retrospective reflection on the impact of these events on the local scenes. In Chile, it was integrated into the

Documentation Center of the Museo Nacional de Bellas Artes, as part of the 12th Bienal de Artes Mediales celebrations [14]. In Argentina, it joined the Instituto de Investigaciones en Arte y Cultura Dr. Norberto Griffa (IIAC) of the Universidad Tres de Febrero, and resulted in the exhibition “La imagen que desborda: viaje, diario y videoarte” celebrated in 2016 [15]. The exhibition became a unique opportunity to revisit the works and documents that make up the Pascal Gallet Fund and the IIAC Archive, particularly the exchanges of gazes proposed by the video travel diaries in made by French, South American and Baltic artists involved in the aforementioned festivals.

In 2008, another important project was orchestrated to rescue CEMA's U-matic archive in Uruguay. As mentioned before, the Centro de Medios Audiovisuales was a Uruguayan audiovisual production company that developed a significant video production since 1982 and played a very active role in the organization of the Encuentros Latinoamericanos de Video. The team coordinated by researcher Mariel Balás — supported by the Universidad de la República and the Instituto del Cine y el Audiovisual (ICAU) — undertook the digitization of the production company's archive in order to save it from irremediable deterioration. Subsequently, they edited the book “CEMA: Archivo, video y restauración democrática” [16], which covered both the work carried out by this audiovisual collective and the trajectory of the research project.

For its part, the cultural association responsible for the organization of the VideoBrasil festival has focused its efforts on maintaining a physical headquarters to safeguard its collection, composed of thousands of catalogued audiovisual and documentary pieces. Among them, around 1,500 are videographic works that have passed through the festival. The digitization process of this collection began in 2007. At this time, the possibility of publishing them online was considered, although in the end this task was not carried out due to copyright limitations [17]. However, the option to consult the catalog of its institutional website allows access to files that provide a brief synopsis, an image and the details of its participation in VideoBrasil [18]. Likewise, the association has not ceased to promote activities for the re-reading and reactivation of its collection, including exhibitions, publications, artistic and research residencies, among others.

In close connection with the need to give visibility to works shown in events such as Buenos Aires Video, or the Festivales Franco-Chilenos and Franco-Latinos, the ARCA Video Argentino project was born. The initiative emerged in 2008 with the aim of digitally remediating the pieces of a history of Argentine video that addressed the works exhibited in the city of Buenos Aires from the 1980s to the present, and under the desire to extend to the whole country. Coordinated by researcher Mariela Cantú, it had the support and funding of the Universidad Nacional de La Plata and the Argentine Fondo Nacional de las Artes in the different phases of the project [19]. Revamped in 2021, the website embed videos and information from many other online platforms and sites. The collaborative and non-profit nature

of Arca website appeals to the interest of the authors themselves to circulate works which helps to complete the history of Argentinian video art. In this way, it avoids some of the difficulties posed by copyright when it comes to making this content accessible [20].

Although there are many more, the cases presented allow an approximation to initiatives that have proposed to face the challenges involved in the rescue of stories linked to unstable media. Likewise, not all the works and documents published on these platforms have a physical backup, i.e., much of the information published only exists in digital format. On the other hand, the physical collections (partially) digitized and converted into digital archives; facilitate the circulation of works and documentary collections on video art of the Southern Cone. In this sense, both those that have physical support and those that do not, become resistant forms of archive [21] keeping the works alive and making possible to formulate new approaches and narratives about video art in the region.

### **Video art and archive: a problematic relationship**

After this punctual mapping of video art festivals, audiovisual archives and remediation projects, it is possible to point out some problems video art archives have to face. The issues proposed below are not exclusive to analog and digital video art archives in the Southern Cone, but they pose methodological challenges and technical difficulties to researchers interested in studying these corpuses. Regarding each one of these points, some of answers articulated by the referred research projects are pointed out.

**Geographical Dispersion.** Geographical distance between archives makes the possibilities of consulting audiovisual collections in the Southern Cone scarce or intricate, and makes the approach to local and regional histories a difficult task. Furthermore, while many of the institutions mentioned offer partial online cataloguing records, others do not even provide this information.

Although presented as the better answer, the digital remediation of video-based art and their circulation on various online platforms does not solve this problem. The dispersion of audiovisual content and the difficulty of finding a corpus of works gathered in the same place also exist in the networked world. However, most of the research projects that have online archives also facilitate cross-referencing with other audiovisual platforms and with websites of related or connected projects, an aspect that partially facilitates the exploratory task.

**Documentary Gaps in Archives.** The criteria for the creation of video art archives and video libraries have not been stable, nor have uniform standards been established for the registration and cataloguing of the pieces incorporated. Audiovisual works usually come together with records of activities and various institutional documents related or not to these works. However, the biggest problem arises when institutions lack records, documentation or copies of the materials edited or produced by the institution itself. A feasible hypothesis about these gaps is that, at the time of

the flourishing of video art, those institutions simply did not contemplate the possibility of implementing systematic documentation and archiving practices on these time-based artistic manifestations. Therefore, the safeguarding of these materials was at the mercy of the involvement and archival skills of those responsible on duty.

Perhaps the only solution to the problems posed by the dispersion and gaps in the archives is to support local research projects, in regular contact with the institutional collections, capable of constructing critical readings and deepening the investigation of these materials in different archives. Only the circulation of multiple projects that propose this type of approach will make possible the articulation of new regional panoramic research.

**Status of work and copyright.** As a recurrent policy, video art activities and festivals stipulated in their terms & conditions that a copy of the selected work should remain at the disposal of the organizing institution. By participating, the author automatically consented that his or her work could be used for non-commercial cultural purposes, or destined to video libraries. In this way, the collection of these materials grew gradually, according to the success of the events organized. For the institutions, video was easy to exhibit and store, and for the video artists, its inclusion in institutional collections ensured the circulation of their productions. Thus, the pieces presented acted as "works" when screened at the festivals, but then regained their "copy" status in the archive. When the festivals ceased to be held and the video libraries closed their doors to the public, the supports remained in a place of patrimonial lack of definition, sometimes aggravated by gaps in their documentation. In other words, although there is some document that proves that they entered the institution, their condition between movable object, patrimonial work and documentary collection keeps them in a state of undetermined status, and, therefore, any type of audiovisual record for publication would incur in copyright problems.

In this case, the solutions implemented by projects such as ARCA have consisted of becoming open collaborative platforms. Its expansion strategy is based on achieving voluntary assignments, and offering hyperlinks to websites of authors and institutions, which own the copyright of the original works or documentation.

**Inaccessibility and Loss of Works in Unstable Media.** As long as archives and video libraries remained active, video art works remained alive and continued to be included in multiple proposals. With the digital transformation, the analog technological equipment provided to access the works became obsolete, and the works became inaccessible. As already mentioned, very few archives and institutional video libraries have undertaken the task of digitizing their collections. This has been excused on the grounds of copyright issues and the high costs of digitization for the institutions, and although some authors have undertaken this task individually, other works have been lost or are inaccessible today.

However, there are other important reasons that have

marked this state of affairs, linked to the fickle institutionalization policies in the region and the preservation challenges posed by unstable media-based supports. Video art has traditionally played the outsider's role in museums and cultural spaces. Besides, except for some — genuine or opportunistic — demonstration of interest subject to certain management, there have been created none public policies for specific protection, nor have there been any sustained efforts to enhance the value of these productions.

On the other hand, we start from the premise that both analog and digital supports are unstable, and although their digital remediation would allow extending their endurance, it is necessary to accompany such actions with others that provide them with meaning and ensure different ways of persistence.

In this sense, the work carried out by projects such as "U-MATIC" in Chile, the rescue of the CEMA Archive, or the exhibition "Video\_MAC", constitute multidisciplinary research projects that go beyond digital remediation. They open the possibility of generating new readings on collections that would otherwise vanish from the memory of regional art histories. As we have seen throughout this presentation, these efforts favor the study and dissemination of video art works, through the conservation and remediation of historical pieces, the circulation of these investigations and the expansion and reformulation of the genealogies of video art in the Southern Cone

## Conclusions

The aim of this presentation was to reflect on the unstable and complex relationships established between video art and archives —analogical and digital— linked to pioneering video art events in the Southern Cone. The cases presented have sought to make these problems tangible and to make visible the need to aspire to an archival praxis that allows for the protection of this audiovisual heritage. The aforementioned research projects show the importance of having funds and archives that make possible the survival of works and documentation on video art production.

In reference to the advent of networked culture and the digital turn, it has been emphasized the positive aspects of the emergence of research projects and audiovisual remediation which have made possible it to articulate new narratives on video art in the region. However, digital platforms —emerged from some of these projects— are also ephemeral, as Mariela Cantú points out the internet is "an accumulation of ruins, links that do not work, replicated information, outdated data" [22].

Supporting and stimulating the development of research in this field is necessary and complements, but does not replace, the responsibility that institutions have taken on in hosting documentary collections and audiovisual works. The institutions that safeguard these collections should promote actions for the endurance of this valuable patrimonial material, articulating joint rescue and research projects that allow the synergy of forces and financing

between cultural and educational institutions. Ultimately, this could be a way to ensure the continuity of the analog and digital past.

Thanks to the action of projects with an academic-institutional base, it has been possible to recover patrimonial works and to reconstruct stories of great value, which constitute an exceptional example of what could and should be done. The value such actions, as many media archaeologists insist, is that it reinscribes the analogical past in the coordinates of the present, and guarantee the institutional commitment to preserve the works and ensure their longevity.

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## Author Biography

Alejandra Crescentino is a PhD candidate in the Program Artistic, Literary and Cultural Studies (EALyC), and Teaching and Research Personnel in Training (PDIF) in the Department of Linguistics, Modern Languages, Logic and Philosophy of Science, Theory of Literature and Comparative Literature, and East Asian Studies, of the Facultad de Filosofía y Letras, Universidad Autónoma de Madrid.

She obtained a Master's degree in EALyC from the Universidad Autónoma de Madrid in 2016. She graduated with a degree in History of Fine Arts in 2013 and Professor in Art History in 2009 from the Universidad Nacional de Cuyo, Argentina. She is a member of the research group “DeVisiones. Discourses, genealogies and practices in contemporary visual creation”, Universidad Autónoma de Madrid, <https://www.devisiones.com/>

# The future of art museums in the digital age: Using virtual reality for archiving purposes

Ze Gao<sup>1</sup> and Varvara Guljajeva<sup>1,2</sup>

<sup>1</sup>Computational Media and Arts, Hong Kong University of Science and Technology (Guangzhou)  
Guangzhou, CHINA

<sup>2</sup> Integrative Systems and Design, Hong Kong University of Science and Technology,  
Hong Kong, CHINA  
zgaoap@connect.ust.hk | varvarag@ust.hk

## Abstract

Art museums are committed to expanding the digital display of their archives by using digital technology, diversifying the types and forms of their exhibitions, increasing archival formats, and promoting repeated visits anytime, anywhere. Many museums have also begun to use virtual reality (VR) display platforms such as Google Arts & Culture, which is intended primarily for viewing art in high resolution images and video. More than 2,000 cultural institutions, including the Guggenheim Museum in New York and Orsay Museum in Paris, use this platform to provide virtual content<sup>1</sup>. It is reasonable to infer from this that the rising popularity of VR technology and of online VR platforms targeting the art sector should also have potential application in archival work. For example, the National Museum of Modern and Contemporary Art (MMCA) in Seoul already utilizes VR technology for documenting its physical exhibitions. However, despite the growing application of this technology, few studies have comprehensively studied the forms and content of the artworks archived in traditional museums (i.e., paintings and photographs) and by comparison to electronic art archives that utilize modern VR technology. By analyzing the advantages and disadvantages of virtual reality technology, this study aims to explore the potential of such applications in the context of digital archiving. In this paper, we take several major modern and/or contemporary art museums as examples for analysis and comparison. We show that virtual reality technology has brought advantages to the archival work of contemporary art museums, such as enhanced immersion and expanded diversity of exhibits. Further, it appears likely that the increasing commodification of VR technology will further possibilities in the future.

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<sup>1</sup> Data from <https://artsandculture.google.com>

## Keywords

Art museums, virtual reality, VR, digital archive, visual tour.

## Introduction

According to Tallulah Harvey, in her eco-critical research “The Archive”, the role of a digital archive is to digitize human cultural productions [1]. As a result of lockdowns during the COVID-19 pandemic, humanity experienced a greater hunger for culture than ever before. Government policy during the pandemic typically required public institutions to close their doors, creating new and difficult challenges for art institutions. Online presence and content became crucial. Museums and galleries launched 3D and video tours of their exhibitions, and held numerous online artist talks and conferences. For example, the travelling, moving-image exhibition *Watch and Chill: Streaming Art to Your Homes* was held by M+ in February 2022, and featured more than 20 video works by contemporary artists across Asia.<sup>2</sup>

One of the core issues in discussions about the preservation and online distribution of media art is the difficulty of representing the spatial and interactive nature of such artworks in the form of digital archives. The Ars Electronica Archive<sup>3</sup>, for example, is a near complete archive platform that documents artworks of the Prix Ars Electronica Festival from 1979 until today and organizes works by award, picture, print, and map. Another

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<sup>2</sup> Watch and Chill: Streaming Art to Your Homes, as part of the M+ International initiative, serves as a springboard for the discussion of innovative forms of collaborations and of the new potential that lies in today’s hybrid environments.

<sup>3</sup> Ars Electronica holds one of the world’s largest archives of digital media art and spans the past 40 years. It contains the documentation of the Ars Electronica Festival since 1979. Accessible at <https://archive.aec.at>

important archive for digital art is the Archive of Digital Art (ADA)<sup>4</sup>, which primarily uses video, image, text and audio formats to document artworks. In addition, hyperlinks have a significant role in interconnecting the various entries in ADA. A good search engine is a vital part of every archive, enabling the user to filter entries by category, date, genre, events, and keywords. Both of these digital archives—Ars Electronica and ADA—are extensively used by media art scholars worldwide. However, from the perspective of the non-expert audience, the more complicated navigation of entries and often low-quality videos and images may introduce additional challenges to attaining a complete or immersive/intimate understanding of the archived artworks. What if archived artworks could instead be experienced in VR? And would this be unreasonably costly to achieve?

It is important to ask what the art institutions can do to offer a better experience to their online visitors, to facilitate remote exhibition visits, and to ensure wider access to art shows or specific artworks where requested. Many contemporary artworks are difficult to be archived as a single image or video. For example, while performance art researchers and archivists mainly use video to preserve the art of performance, they admit that it is not the best way [2]. There are, however, limitations to every archiving method, for example, video is essentially a 2D technology trying to describe 3D space and is often compromised for that reason. Similar challenges can arise in archiving interactive and installation art pieces. In addition to image-based media, there are often complex relationships between documents, pictures, and videos. Thus, it may be very difficult, if not impossible, to capture all the details and moments of live art in order to recreate as closely as possible the experience of physical presence.



Figure 1. VR Tour of HKDI Gallery, Zaha Hadid Architects - Vertical Urbanism.

Considering the diversity of archived works of art in various museums, VR accompanied by guiding instruction—such as the archives' VR tour of the MMCA

in Seoul, Korea—may be a practical and efficient method of archiving.<sup>5</sup> Such a method of documentation can provide a spatial, sensory and immersive experience that is further enhanced by navigation with the aid of narrative and iconographic guidance. For instance, the online VR tour 'Vertical Urbanism', on the Hong Kong Design Institute website, showcases the use of directional circles to improve user navigation (see Figure 1).

## Use of VR in Exhibitions and Archives

The world is moving to digitalization, and art lovers are rapidly shifting their interest and preference to museums and artworks that incorporate modern technologies [3]. Art institutions' interest in VR applications has sharply increased during the lockdown, especially after the Oculus Quest 2 VR headset launch. This technology registered five times the projected number of pre-orders as people sought to escape the boredom and social restrictions of the pandemic, engage in the art world, and visit exhibitions. More importantly, the professionals, like art critics and researchers, were able to resume their work. Throughout the course of 2020, museums and art galleries pivoted towards digital solutions, and many institutions made significant investments in VR. The primary advantage of this technology is its immersiveness. It allows the audience to be fully engaged with the artwork and to actively interact with each exhibit too. In their paper, Shehade and Stylianou-Lambert, after conducting multiple interviews with museum professionals, conclude that interaction with exhibits has become a crucial part of audience engagement [4].

Today, visitors want to feel as if they are part of the exhibition; they want to interact with the artworks on a personal level and relate to the emotions and thinking patterns of the artists that produced them. VR technology offers that illusion to the audience by allowing them to enter into a virtual space that may take the form of a 360-degree video or an interactive environment. It enables museums and galleries to bring artworks to life and offers an ideal platform for different and unique experiences as the audience becomes deeply embedded within the virtual exhibition [5]. For this reason, many leading art institutions around the world are actively embracing VR.

In the past five years, several well-known contemporary art museums have utilized various kinds of VR technology to conduct exhibitions or offer educational programs to their audience. For example, in 2019 the Louvre integrated VR technology into its exhibition *Mona Lisa: Beyond the Glass*, and London's Tate Modern integrated VR into its Modigliani retrospective in 2017. The latter offered an immersive experience whereby

<sup>4</sup> Accessible at <https://www.digitalartarchive.at>

<sup>5</sup><https://my.matterport.com/show/?m=pmHCAXnPHVu&brand=0>

visitors could interact with a 3D model of Modigliani's artist studio in Paris. Visitors could tour the room and share the artist's personal space, and everyone felt as if he or she was the only person in the studio.

Of course, VR is not only being utilized by art institutions; it is a part of the artist's toolkit too: in the Museum of Modern Art (MoMA), Niko Koppel has showcased his VR project *Crime Scene*, a story about the victims of police brutality [6]; at the Whitney Biennial, Jordan Wolfson exhibited his extremely bloody virtual-reality artwork *Real Violence* [7]; and artist Ian Cheng created a VR *Pokemon Go*-like installation for the Liverpool Biennial named *Emissary Forks For You* [8].

As of January 14, 2022, the website of MMCA in Seoul had 8,771 exhibits on display online, all of which could be viewed in VR on the official website offering visitors a more interactive and immersive experience (see Figure 2). Unlike the traditional method of digital archiving that mainly documents artworks in the form of photography and video, VR technology enables the entire exhibition, its spatial organization, navigation and orientation between individual artworks to be preserved thereby allowing a more complete experience of the show. Nevertheless, the use of one method of archiving need not require the exclusion of the other. On the contrary, VR technology can supplement and support digital archives, introducing novel tools such as VR tours that help to better document entire exhibitions and make the archives more engaging and accessible for the wider, non-professional audience. Like all technology, VR does have its limitations. For example, current VR tours do not offer metadata tagging, which makes it difficult to search for specific artists or artifacts without having first to navigate the virtual exhibition as a whole.

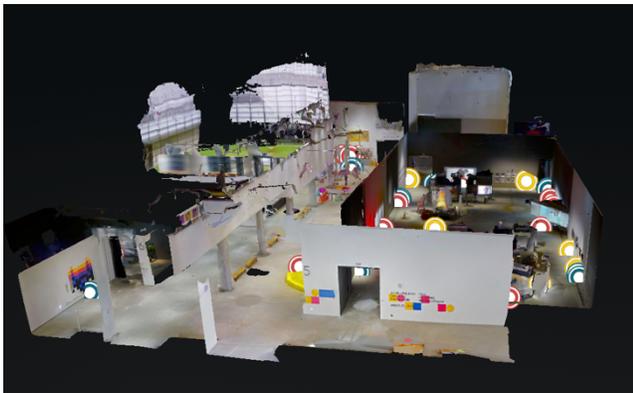


Figure 2. VR Tour of MMCA's 2020 Asia project, *Looking for Another Family*.

The VR tour *To Exhibit – Not to Expose – To Expose – Not to Exhibit*, by artist Mario Santamaria, was produced for the reopening of the Centre d'Art Santa Mònica in Barcelona, Spain in September 2021 [9]. The tour enabled

its audience not only to visit the museum's cloister and exhibition areas, but also to investigate its most inaccessible corners, to explore unusual perspectives and follow its routes—and all without leaving the comfort of home. This particular virtual tour remained open after the exhibition's official dates, which allowed the artist to extend his show in time and space. This example shows how VR can offer an alternative to traditional museum visits that consist of moving from one exhibition hall to another, contemplating the work of art, reading the text on the wall, and buying a souvenir from the store before leaving.

## The Pros and Cons of VR Technology

While art institutions have utilized this technology during lockdowns to satisfy their audience's yearning for art and culture, will this new practice of virtual museums continue after the pandemic? The example of MMCA in Seoul demonstrates that VR can be applied to almost any physical exhibition. More importantly, traditional media can be easily integrated into a VR archive, such as photographs, videos, audio, and the texts that are present in digital archives.

To summarize, the potential of VR applications for archives is as follows:

- VR archives can capture the precise details of an exhibition's set-up at the moment the artwork(s) were exhibited. Hence, the audience can get a glimpse of the physical space and design of the exhibition in addition to viewing the individual artworks.
- Time and location do not matter. Visitors can browse an archive by themselves at any time and from any location using VR equipment or with the use of a computer screen if the user does not own a VR headset.
- Installation art can be viewed more fully in VR.
- VR archives can accommodate huge collections and offer an easily scalable solution to the growing archives of museums. It is indeed a challenge for any museum to display all its archived material in its physical space. The Art Institute of Chicago Museum Collection Online has more than 300,000 paintings, sculptures, and decorative artworks from around the world [10]. The Guggenheim Museum's permanent collection offers a searchable database of selected artworks from an online archive of around 8,000 items [11] and is continually expanding. The MoMA collection includes more than 150,000 paintings, sculptures, sketches, prints, photos, architectural models, drawings, and design objects, approximately 22,000 films and 4 million film

stills. Further, it contains more than 300,000 books [12], periodicals and the personal archives of more than 70,000 artists.

- Further developments in VR may enable us to expand beyond visual material and integrate other sensory material too, such as touch and haptic feedback.
- Digital and VR art can be viewed in its original format.
- The use of VR in digital archives allows artworks to become accessible to a wider, non-professional audience.
- The interactivity of VR provides additional potential for educational and curatorial programs.

VR applications in archives also present challenges:

- The equipment can be expensive. Although a VR mode may be available in all visual tours, due to the cost of equipment only a smaller number of people may be able to view that content simultaneously in VR. For the remaining audience, a screen may be used for viewing. Hence, the immersiveness of virtual exhibits may be compromised or lost.
- Elderly people may find it difficult to use VR technology. This could be overcome with additional help and assistance.
- Building a VR environment is a labor- and cost-intensive process, especially at the start.
- Much time and money can be spent on retaining archived data and VR maintenance.
- Existing 3D tour applications, like Matterport, use proprietary software, and this limitation may cause problems in the readability of models in the long term. For instance, Matterport does not offer access to source files.

Is a VR-mediated virtual viewing experience a truly engaging art experience or not? Seeing physical works of art in person is likely to be more moving than viewing them online through a mediated virtual experience, but it is important to note that VR archives are not intended to replace physical exhibitions entirely. Rather, the use of VR is intended to support art institutions in documenting and preserving exhibitions. Nonetheless, the development of immersive technology in the form of VR and advanced computer applications can enable the creation of realistic simulated environments. Some authors and researchers believe that simulations may in the future have ultra-realistic physical similarity to the actual physical environment [13]. Thus, in the context of VR archiving, the relationship between physical simulation of virtual scenes and the cognitive sensory experience of real scenes should be further explored and understood.

## Conclusions and Recommendations

Currently, several VR applications are already being used for archiving and virtual exhibition purposes, including Google Arts & Culture and Matterport. It can be that a virtual tour experience is not always engaging, however, it serves for recalling physical visits or creating an as-if-you-have-been-there feeling. In addition, the future development of virtual reality technology in the context of digital archives could enable us to save the operating procedures of interactive and generative art too.

The existing search and filtering methods for archived artworks and artists on institutions' websites are not meant for the general public but for art professionals experienced in navigating digital archives. Moreover, most online archives are 2D displays that are not ideal for digital art that has interactive and immersive qualities.

VR archiving might be very suitable for expanding digital archives, enabling 3D views, and supporting additional formats. More importantly, VR has the potential to be combined with other ubiquitous technologies, such as augmented reality and mixed reality, in future applications. Thus, we should aim to explore, devise and exploit the ways in which VR may enhance digital archives and make them more immersive, such as haptic feedback and other sensory experiences.

Although VR may appear more suitable for exhibition archives than existing methods like ADA or Ars Electronica Archive, its utilization does not need exclusion of the latter. If VR technology is used as an auxiliary archiving tool, it can support and enhance user experiences when exploring archives and help the audience to recall their experience after visiting an exhibition in the physical location. VR is likely to increase the number of digital archives users because its utilization enables content to be presented in a more engaging and immersive way.

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## Authors Biographies

### ZE GAO

Ze Gao is an interdisciplinary artist, curator and media art researcher. Working in the intersection of art and technology. He studied Multidisciplinary Fine Arts at the Maryland Institute College of Art and received his M.F.A from The School of Visual Arts in New York. With a background in both image science and art, his research across different practices and interests, including artificial intelligence, human-computer interaction, museum study and extended reality. He has several publications, mainly in the areas of New Media Art and Chinese Classical, he currently living in Hong Kong and Guangzhou. He has been invited as a visiting scholar to the Department of Philosophy, Sun Yat-sen University(Guangzhou, China,2020), Confucius Institute, University of Bonn,(Bonn, Germany, 2019), and School of Art and Design, Yunnan University,(Kunming, China,2019), residence artists at Nanchuan Lixiang Lake Art residence project, Sichuan Academy of Fine Arts,(Chongqing, China,2020), Glasgow School of Art,(Glasgow, Scotland, UK,2014).

### Dr. Varvara Guljajeva

Dr Varvara Guljajeva is an artist and researcher holding the position of Assistant Professor in Computational Media and Arts at the Hong Kong University of Science and Technology (Guangzhou). Previously, she held positions at the Estonian Academy of Arts and Elisava Design School in Barcelona. Varvara was invited as a visiting researcher to XRL, Hong Kong City University, IAMAS (Ogaki, Japan), LJMU (Liverpool, UK), Interface Cultures in the Linz University of Art, and Design, Blekinge Institute of Technology (Karlshamn, Sweden). Her PhD thesis "From Interaction to Post-Participation: The Disappearing Role of the Active Participant" (defended in 2018 in Estonian Academy of Arts) was selected as the highest-ranking abstracts by Leonardo Labs in 2020.

As an artist, she works together with Mar Canet forming an artist duo Varvara & Mar. Often the duo's work is inspired by the information age. In their practice, they confront social changes and the impact of the technological era. The duo has been exhibiting in international shows since 2009. Their works were shown at MAD in New York, FACT in Liverpool, Santa Monica in Barcelona, Barbican in London, Onassis Cultural Centre in Athens, Ars Electronica museum in Linz, ZKM in Karlsruhe, and more.

# **-Short Papers-**

# Conservation of Multimedia Art: Case Study on Teoman Madra Archive

**Selçuk Artut, Begüm Çelik**

Sabancı University

Istanbul, Turkey

selcuk.artut@sabanciuniv.edu, begumcelik@sabanciuniv.edu

## Abstract

This paper focuses on the archival process of the multimedia artist Teoman Madra who is an acclaimed artist creating artworks with technological means of multimedia capabilities between the 1960s to early 2000s. Preserving multimedia artworks is a challenging task that requires comprehensive solutions due to the nature of the always-changing technological environment. It is inevitable that there is a paradigm shift from the traditional approach to preserve the artworks as self-contained physical objects to a broader scope of regarding the artwork as an entity with its tangible and intangible dimensions. This manuscript stands as the debut academic dissemination of the intensive archiving process of the Turkish multimedia artist Teoman Madra and it aims to shed light on the missing answers for the following question, "How did the media arts evolve in Turkey between the 1960s and 2000s?" The cataloging process of the linear media (VHS, BETAMAX, miniDV, negatives, diapositive, etc) and the methodologies implemented for descriptive analysis have been discussed in detail.

## Keywords

Technological Arts Preservation, Teoman Madra, Media Archive, Multimedia Art, Media Art, Computer Art, Video Art, Cataloging, Metadata

## Introduction

No art movement or artistic thought in history has emerged out of nowhere. In the last few decades, there has been a huge increase in the number of digital artworks produced, and interest in this type of art has skyrocketed. In the plethora of audiovisual carnivals, while revisiting Teoman Madra's works today, this study aims to put the missing stone into its place to underline the importance of endorsing the continuous transformation of art's cumulative evolution.

## Background: Teoman Madra's Art Career

Photography and multimedia artist Teoman Madra was born in Istanbul in 1931. After graduating from Galatasaray High School, he went to the United States in 1950 to study for his undergraduate education. His interest in Contemporary Art and Avant-garde Jazz Music grew during his education in California and New York between 1950-54. In 1955, he bought his first Voigtlander Vito B camera from a major during his military service in Turkey. In his own words, he defines himself as a Fluxus artist, literally after 1962, thanks to this camera that allows superimposing one after the other. In 1964, his first exhibition - The Abstract Exhibition with Jazz Lines was shown in Istanbul, Beyoğlu City Gallery.

With his debut exhibition of abstract photogram works, Madra had started his half a century career in art production. Between 1970 and 1990, he produced artworks influenced by Fluxus aesthetics that are mainly based on abstract photography, contemporary dance, and contemporary music.

Teoman Madra held his first exhibition abroad in 1967 at the Paris Young Artists Biennial, with the "Photograms in Jazz Rhythm" exhibition. Then, he continued to exhibit his photogram series, which he named Light Games, at home and abroad, accompanied by Modern Jazz music. During the 1970s, he tried to interact with multiple senses with light, music, and movement in the multimedia shows he organized around the concept of Synesthesia. Teoman

Madra defines Synesthesia as the combination of contemporary arts with aesthetic sensitivity and the definition of multimedia as the application of advanced technology to new areas of use in unusual environments.<sup>1</sup>

In 1985, he acquired his first computer, the Amiga. While he continues to exhibit multimedia shows at every

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<sup>1</sup> From a program note on the Synesthesia 83 performance at the Turkish American Society, 27th of May 1983

opportunity, after a while he begins to include computer-generated visuals in his works. He is one of the leading artists in Turkey, who prepares multimedia shows accompanied by contemporary music using these new technologies in the 1990s. In an interview, Madra summarizes his work as follows: “I am creating my work on random fiction. I combine technology with art. I reshape the photograph using digital possibilities. I create images as I want at that moment without a certain scenario or rule. There is always contemporary music in the background. I can say that my works are more abstract and experimental.”

In Madra’s early works, we are observing a series of experimental photography works based on the techniques of photogram and long exposure. These works have been generated by moving a flashlight gently in front of an open lens with hand gestures accompanying modern jazz music in a dark room. Similar to the work of a painter on a canvas, with the harmony of the music, various shapes and compositions were produced inline within the spatial depth that the photography provides.



Figure 1. Light Games (circa the 1960s) ©Teoman Madra Collection.

**Table 1:**

*Archiving Processes and Brief Definitions*

Exploration of the collection	Detecting the archival material and researching related archival material
Technical Examination	Inspection of the physical and digital material, draft categorization for conversion operation
Media Conversion	Converting existing media formats to updated formats, digitization, storage
Determining significance	Distinguishing the relevant materials, eliminating the redundancy
Building a Data Structure	Configuring a proper data structure for cataloging items effectively
Copyrights Management	Managing intellectual properties, negotiating licences, describing usage rights
Preservation	Configuring maintenance measures, prevent physical deterioration
Accessibility	Allowing outside users to explore the contents and to participate the process

**Preservation Strategy: Technical Examination and the Digitization Processes**

Since it is necessary to approach the classification of technological works of art through the overlapping axes of art, science, and technology, it becomes difficult to make a clear and comprehensive definition. [1] As a consequence, the emergence of portraying artwork-specific methods and processes becomes inevitable when preservation measures are considered. The targeted methods and the planned

processes within the scope of this research have been described as in the above chart.

The initial step of archiving the Teoman Madra works was attempted in January 2021. The archival materials were located in three different locations, a large collection in Madra's hometown, Ayvalık, and the remaining in Madra’s home and a depot in İstanbul. Physical storage media were abundant in the form of prints, dia slides, negative films, VHS, Betamax, miniDV, hi8 video tapes, DVDs, CD-ROMS, hard drives, and thumb drives. However, no proper cataloging effort had been done

before, and the materials were about to deteriorate due to poor physical storage conditions. Also, except for a few items, they were not identified by proper name tags. Transferring physical materials to digital media was an urgent necessity for long-term access. First, the existing materials were organized into groups according to their media types i.e. VHS, Betamax, negatives, prints, and they were tagged physically with such media type-based unique identifiers. Later several digitization processes have been implemented with different techniques due to the varying medium necessities. According to Cleveland, digitization is the process of scanning, sampling, or even re-keying any fixed or analog medium, such as books, journal articles, images, artworks, or microforms, into electronic form. [2]

In the scope of this paper, we include only the archival process of static images and linear temporal multimedia works. In the beginning, due to the inability to predict the vastness and usefulness of the materials at hand, the digitization process mainly relied on the simple recovery of the analog content while establishing the referential links between the original media and the digitized content. Thus, it is assumed that those who would like to set up research on the archive, should need to use the referential system to gather more precise and high-resolution visual content with the technical capabilities of the time. After a year of intensive work on the hard cataloging and digitization process, 351 hours of linear media (VHS, Betamax, miniDV) and 14,494 slides/negatives have been digitized and backed up safely on local drives and cloud storage services. As Gómez-Baeza states conservation does not end with digitization but presupposes a continuous struggle with the medium itself. [3] Preservation's principal aim certainly is to provide access to the original, but continuous technical advancements pose a threat to this aspect. Likewise, digital preservation should be seen as a constant effort to remediate the existing content. [4]

### **Cataloging Digital Media**

The cataloging process has been initialized after the digitization of all accessible media was finalized. This process requires a detailed descriptive analysis since there are no work-specific statements of the artist nor a title is given. The question asked at first was "What am I cataloging?" as recommended in Cataloging Cultural Objects to set a framework for the choices to be made. [5] Teoman Madra was an artist, who practiced photography and video as an artistic medium, as well as a decent documenter. Since both videos and photographs have the potential to be an art medium in itself and also documentation for other works of art, it is essential to differentiate whether a recording from his archive should be considered as artwork or documentary. Teoman Madra,

as a multimedia artist, was collaborating with many artists from various disciplines such as contemporary dance, performance, and music, by this means, he was actively taking part in the art scene of the time. That being the case, his archive includes his artworks and additionally many documentation of artworks owned by others, happenings, and events at the time. These documentations have not been eliminated from the digital archive, because besides the potential to reflect the art scene the artist is in, they contain records that may not even be available to the authors of the works being recorded. In the process of developing a fielded database, this dual nature of records, the possibility of being documentary or artwork, was taken into consideration.

After what to be cataloged has been decided, the second step taken was to agree upon data standards including data structure, data values, and data content for the sake of consistency in descriptive cataloging and an increase in end-user access. [6] In the establishment stage of standards, starting from the data structure which can be described as the metadata element set to format the database of records, the widely acclaimed schemas were investigated. Although there is no such scheme as a "one-size-fits-all" metadata system, many major museum management systems' data dictionaries are based on the CDWA scheme. [7] Categories for the Description of Works of Art (CDWA) schema have been chosen for this archive as well because of its widespread use in today's digital museum systems with its comprehensive categories for characterization of artworks and allowance for integration of data to other systems.

Once the database structure was built, examination of all digital materials was started. The first data entries were the records of the digital scans of negative slides. Thanks to the descriptive naming of each image file done by Tulya Madra, daughter of Teoman Madra, data values were filled following her identification regarding the characters, events, and locations the photographs were taken at. Since Tulya Madra is largely an eyewitness to the artist's production, she can examine the contents of the photographs based on her own experiences. The titles of artworks remained 'Untitled' followed by consecutive index numbering since there are no specific names given by the artist himself. Next in order comes the examination step of the video recordings, the digitized versions of VHS, Betamax, MiniDV, etc., which requires further feedback from project holders. In that stage, each file was aimed to be cut into multiple coherent pieces concerning the artist's intention of creation. In general, the partition operation was performed based on empty tape displays in between the video records. If not so, the pieces were arranged according to the content of scenes, their visual style, or the musical compositions. The obtained pieces were uploaded to the previously obtained cloud service while keeping them

together in the same directory with the original recording untouched. In the descriptions of these pieces, both the phrases the artist gives references to and the appropriate choice of keywords from the initially decided tag cloud were provided. Even though the artworks or documentaries were described by project holders using associated terms, the data values for other identifiers including the characters who took part in, the locations, or the date when the artwork was born could not be presented distinctly. It is considered that the data contents, which cannot be fulfilled at this stage of the research, would be completed in future studies. In such cases, where the information for core fields, marked as necessary by CDWA authority, is missing and can not be supplied for previously mentioned reasons the data values are substituted with “unknown” values as recommended in the CDWA List of Categories and Definitions. [8]

### **Future Work**

On the current course, the digitization and cataloging stages necessitated a significant amount of archiving effort. Nonetheless, there are many more to be taken in this path. After all digital media is examined by authors, the subject tree, in other words, the classification scheme, will be constructed following the content of the Teoman Madra archive since it will be fully observed. The Art and Architecture Thesaurus by the Getty Research Institute has been determined to be used for that purpose by the reason of its multilingual, semantically structured thesauri which is described as a powerful tool in the case of enriching the knowledge and providing valid interconnections for cultural heritage information resources by Baca and Gill. [9] A subject tree can be described as a hierarchical structure of named categories that might be browsed for information on a specific subject in a web directory. In the stage of developing a subject tree, the polyhierarchical approach will be taken. In this way, the same subcategory will be accessible under various categories. This approach will provide more flexibility in the categorization of such a digital environment with its allowance for several routes that make users access the requested information. [10]

In line with the explanation given above regarding the cataloging process, one may suggest that the approach is biased since it solely depends on the judgment of project holders because of the lack of formal information. It is undeniable that the scarcity of artist statements or art critiques specified for individual pieces leads to ambiguity in the case. Since the artist was not able to be involved in the process due to health-related concerns, it is not possible to claim that the archive is purely objective, on the contrary, requires the interpretation of authors relying on how they perceive these historical records of the past technological works. However, in addition to being

individual collection pieces, the artworks became knowledge bearers for events and experiences of the past if they are preserved and thereby embedded into an archival system. [11] Thus, the collective examination is a necessity in the case of providing an unbiased approach to works, and also for the fulfillment of missing stones in descriptive identifiers. In line with this purpose, the database of records will be open to discussion in gatherings for whom it may be concerned, the people who were collaborating with the artist, the art critiques of the time, etc. The process of digital art preservation is therefore interdisciplinary, not only because of the collaborative character of its creation, moreover because it necessitates the participation of many other professions for the required combination of theoretical writing with practice-based research. [12]

### **Conclusion**

At this stage of the archiving study, the first five steps of the archival processes (Exploration of the collection, Technical Examination, Media Conversion, Determining significance, Building a Data Structure) that were listed in the chart previously have been achieved. By labeling the original documents belonging to the archive, it is possible to access all the source material in a single physical location with the relevant index references when necessary. After all the digitized contents are categorized, the classification process continues intensively. In the second phase of the research, the remaining materials will be covered with similar methodologies applied. Especially as a result of the widespread use of the Internet since the mid-1990s, we observe that Teoman Madra has appeared more in this environment. In addition, the works he produced with the iPad in the 2000s, which he started to use frequently in the last stages of his active artistic production, will be examined in depth at the second stage of the project.

There are many goals and benefits to be achieved with this research. The first of these is to present important analyzes of what was done in the past in the field of Turkish Media Arts after the 1960s, by leading the work of Teoman Madra to come to light. Another desired outcome is to facilitate the access of Teoman Madra's video documentation to the masses, thus enabling more analysis to be made about the recent history of the cultural and artistic environment. If we look at the issue from a broader perspective, this research presents a comprehensive case study on the preservation of technological art and thus opens up original solution proposals for relevant discussions. It is possible to say that after the archiving work is completed and the archive is made accessible, further research and analysis on the archive will incline to follow.

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## Authors' Biographies

Selçuk ARTUT's artistic research and production focus on theoretical and practical dimensions of human-technology relations. An author of six books and an editor of one, Artut is an Associate Professor at the Visual Arts and Visual Communication Design Program at Sabancı University, Istanbul where he mainly teaches Sound and Interaction Courses.

Multidisciplinary artist Begüm ÇELİK is pursuing her master's degree in Visual Arts & Visual Communication Design program where she completed her B.Sc. in Computer Science & Engineering in 2021. Her artistic production is fed from her interdisciplinary journey by combining technology and performance since she is engaged with many theater practices.

# Archiving Strategies in the Computational Age: Creating a Media + Data Art Digital Media Library Based on a Curatorial Methodology

J.M. Alonso-Calero, J.A. Vertedor-Romero, J.C. Robles-Florida

University of Málaga

Málaga, Spain

[alo@uma.es](mailto:alo@uma.es); [vertedor@uma.es](mailto:vertedor@uma.es); [jcrobles@uma.es](mailto:jcrobles@uma.es)

## Abstract

As an innovative solution to the challenges of documenting, indexing and researching new media art, this proposal proposes the creation of the Video-Policy media library (from now on MeViPol) within the framework of the research group HUM-1062: Policies of the audio-visual image and its technological environment in artistic practice. This project focuses on two lines of research. On the one hand, curatorial strategies for archiving works developed in Media Art and Data Art. On the other hand, we consider that the artistic trends encompassed in these two blocks have characteristics of obsolescence due to the rapid advance of technology, so MeViPol proposes a virtual space in which both the programming code with which these works are developed and the records generated for their development, both technical and conceptual, is collected.

## Keywords

Interactive Archive, Media Art, Data Art, curatorial politics, territoriality, otherness, art research

## Introduction and background

We start from the conviction that audio-visual artistic production and its exhibition and dissemination are knowledge producers. Thus, we face the complexity of contemporary artistic practice. It is increasingly necessary to provide multidisciplinary tools to society and local culture to encourage understanding of new audio-visual languages. From this point of view, we focus our attention on the functionality of the media library, whose main purpose is to protect the audio-visual memory and to point out the importance of image and sound in culture.

Media libraries are resource centres designed to meet the academic community's cultural, educational, or research needs. For Marita Sturken, Professor in the Department of Media, Culture and Communication at New York University, "postmodern excavations of the archive" operate by drawing on its contents and at the same time dismantling its structures. In this sense, "much contemporary art can be seen as a deliberate disarrangement of the archives - institutional, authoritarian, colonial - that were considered a guarantee under modernism" [1].

Although the artistic practices around Media Art and Data Art have become critical elements at the intersection of art, science and technology, there is a risk that threatens these creative tendencies, namely rapid technological obsolescence, which implies, among other things, the impossibility of executing certain projects if the technologies with which they were created are no longer updated or their development is halted. To face this problem, it is essential to develop innovative solutions to deal with the collection of documentation, indexing and media art research [2], i.e., creating up-to-date archiving policies.

We can observe that the computational factor is becoming more and more common in the creative field as it allows for a more fluid construction of interdisciplinary environments of interaction between human beings and technology. As Foncuberta (1998) states: "Electronic culture forces us to rethink the whole cultural and political architecture of our value system, it induces us to investigate its remains and to examine ourselves" [3]. In the artistic field, working with specific programming code has enriched the different disciplines by providing the layer of artificiality that allows the spectator/user to interact with the work more directly, making them a participant in the transformation and state of the work [4].

Other studies in this line of research include the curatorial project entitled Deep Storage, 1998. This became the first thematic exhibition of what is today, for many, one of the most important trends in the art world: the figure of the archive. In the catalogue of Deep Storage, Ingrid Schaffner noted that the main aim of the exhibition was to address "storage and archiving as image, metaphor or process in contemporary art. In many cases, fine art storage has practically become an art in its own right" [5].

From this conceptual framework arises our proposal for the creation of MeViPol, whose aim is to meet the pedagogical, cultural and research needs of the Spanish-speaking academic community specialising in Digital Humanities, specifically in the creative environment linked to Media Art and Data Art. We are committed to reflecting on the

diversity of styles in contemporary creation from a broad understanding that integrates new artistic trends and their staging. We believe that observing these movements will provide new research methodologies and diverse processes of creative experimentation.

The fundamental strategy of this project is oriented towards promoting and experimenting with different multi-purpose digital technologies of modular visual programming that are being incorporated into various trends of artistic expression. These new tools demonstrate their usefulness in representing questions around the construction of identities as a differentiating element in the constitution of societies [6] at a time when the figure of the other, the body, the subject, the territory and, in short, coexistence are inevitably crossed by these digital technologies. In this sense, the creative experiences inscribed in the analysis of the ideas of otherness and territorialisation that we intend to highlight are containers of a specular reflection that unites audio-visual praxis, production of the subject and research of the environment [7]. These principles will lay the foundations for establishing the curatorial line implemented in MeViPol.

This project intends to establish a certain taxonomic order from a purely artistic strategy such as curatorial discourse, that is, to create a "proposition, often affirmative, interrogative, inquiring or denouncing, whose arguments are the artistic manifestations selected by the promoter of the story itself" [8]. In addition, we tried to establish cataloguing based on the conceptualisation of a series of artistic works and practices that use audio-visual support and code support. In this way, MeViPol focuses on updating digital resources and their integration into academic research in the artistic field. We aim to articulate new relationships between theory and practice, linking concepts from science and computer technology with interdisciplinary artistic experimentation, using different digital tools and their transmission in workshops and exhibitions, to encourage, promote, socialise and disseminate the use of Media Art and Data Art.

The different lines of action that precede this project support the intention of establishing relations between contemporary art theory and computational artistic practise within the visual arts. The purpose of this is to point out the fusion between the scientific and creative methods to provide a humanist vision linked to the processes of creation related to Media Art and Data Art.

### **Initial hypothesis**

Our hypothesis is based on the need to attend to the archiving of contemporary artistic material developed in Media Art and Data Art environments to create repositories of artistic work, paying special attention to the results generated with creative programming code, as well as to the software, hardware and resources needed for the

visualisation and compilation of the code with which they have been developed.

On the other hand, we consider it necessary to attend to this progressive incorporation of new generative and visualisation languages using curatorial policies and methodologies [9]. This updating is essential to be able to name, through artistic representation, the changes that the phenomenon of globalisation incorporates both in our experience of everyday life (virtualisation of the environment) and in the shaping of our identity processes, like the desire for identification, in the processes of subjectivation, in the perception of the environment and the Other, in short, in the modes of social encounter. This technological knowledge is a very useful instrument for an artistic reading of our present.

### **Objectives**

In this context, the design and creation of MeViPol have been proposed for the management of Media + Data Artworks by the different formats, content supports and visualisation tools and code compilation. We offer the first approach to creating a diverse and combined collection of audio-visual material with other content in visual programming code accompanied by ad-hoc visualisation tools, which will allow us to collect the necessary information following the MIDECIANT model [9]. The objectives we propose for these purposes are the following:

#### **Objective 1: Virtualisation and musealisation of Media Art and Data Art.**

This phase aims to virtualise and musealisation of audio-visual products and their standardisation and homologation to design a repository of artistic production as a historical repository of Media + Data Artworks.

#### **Objective 2: Creation of MeViPol as a repository of the artistic practices of Media + Data Art.**

The idea of the MeViPol project arises as a space with a clear academic component for the reinforcement of artistic production conceptualised in principles of otherness and territorialisation with works ascribed to the categories of Media + Data Art.

#### **Objective 3: Content management, access policies and MeViPol dissemination platform.**

This objective contemplates the policies of incorporation, acquisition, donations, free access to part of the collection, with restricted access to a database of scientific rigour open to researchers.

#### **Objective 4: Develop workshops and artistic production proposals based on transversal competence training.**

The workshops will introduce the tools and produce Media + Data Art projects based on the thematic strategies that characterise MeViPol. The interdisciplinary workshops will specialise in a range of modular visual programming tools,

which will be kept up to date to review the latest software updates and study and incorporate them into these workshops. In this sense, a study has been initiated to establish categories and typologies of software according to their creative use from their application in different innovative trends [figure 1].

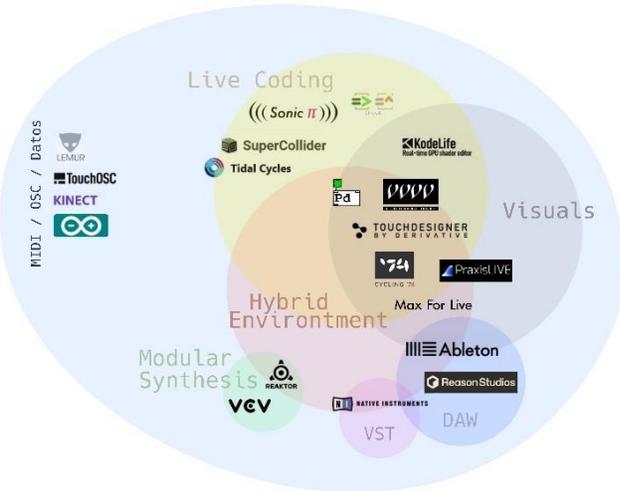


Figure 1 Diagram showing some pieces of software organised by their typology of use in a hybrid creative environment. Image created by Vertedor-Romero, J.A.

## Methodology and working plan

The nature of this project is open and alive in its creation and development, where MeViPol is presented as a qualitative online repository formed by artistic projects that will be selected following curatorial criteria and methodologies through various strategies, these are projects created in the workshops, open calls and own exhibitions, following the line that so far has been developed from the research group, HUM-1062. The aim is to substantiate a development community that offers free access to all the documentation and streaming broadcasts of projects in progress, making the devices that generate them visible.

As for the curatorial methodology to be followed, we will reference the principles established by Harald Szeemann. He is one of the key figures that helped understand how curatorial practice expanded as an autonomous field from the 1960s. His contributions form cartography of curatorial practice, from its independent origins in the 1960s and 1970s to the experimental programmes developed by European and American institutions in our own time. Szeemann describes his curatorial methodology as "structured chaos". His eclectic and varied exhibitions "translucent a boundless energy for research and an encyclopaedic knowledge not only of contemporary art but also of the social and historical events that have shaped our post-Enlightenment world" [10].

On the other hand, there are numerous methodological cases for classification or taxonomy concerning the vocabulary of these new media, languages, and codes, aiming to contrast and categorise works developed in interdisciplinary artistic fields. These studies "start from definitions and technological components of new languages" [11]. In this sense, we will take different references as a methodological basis, such as the case of the "Variable Media Questionnaire": The Variable Media approach, whose objective is to preserve the current work of art, a product of new media. This methodological reference develops a questionnaire based on a taxonomy of new media through behavioural categories [12].

To conclude this section, the following flowchart shows the interaction of the project with the parties (figure 2). On the one hand, MeViPol incorporates the experience in developing the structure of similar repositories in previous research projects, such as VOREMETUR, AEMA or MIDECIANT, in which researchers currently present participating in the MeViPol project has worked. We also consider production lines, curatorship, workshops and internationalisation as resources that will provide MeViPol with content. We add the dissemination of results using their internationalisation and transfer through festivals, publications, congresses and other collaborations. Finally, access for researchers is indicated as the main point of consultation.

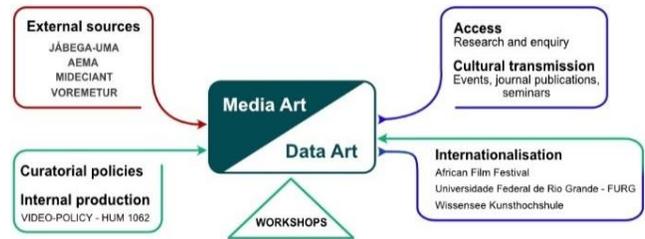


Figure 2. Interaction of the parts that make up the MeViPol creation project. Image created by the project.

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## Authors Biographies

**Alonso-Calero, J.M.** Lecturer and Researcher in Fine Arts. Doctoral thesis: "The flow of the scene in physical interaction: participation, virtuality and presence". He has combined his teaching work with the management and organisation of scientific events related to the hybridisation of artistic and creative languages. Her research activity is carried out in the field of interdisciplinary artistic creation. She is studying for a PhD in Audiovisual Communication. Research grant in a Virtual Reality group in the Department of Computer Architecture to later join the professional world of the audiovisual sector. He carries out different artistic projects framed in the relationship between art and new media, highlighting interaction projects, relational art and territory, etc... IP of projects such as "Map of design transfers", "Bürohack. Bureaucratic Experience by UX", "SCENUX Prototype: a tool for the registration through gamification of the user's experience in creation and reception", "LIMBO Space Social Sound XD".

**Vertedor-Romero, J.A.** Artist and interdisciplinary researcher. Currently on a research stay at the University of Granada with a Margarita Salas grant. PhD in Communication in the audiovisual research line at the University of Málaga. Master's in Interdisciplinary Artistic Production at the Faculty of Fine Arts in Málaga. Research support grant for postgraduate studies at the University of Malaga. Artist-in-Residence Scholarship at the Faculty of Fine Arts in Malaga. Fine Arts at the Faculty of Fine Arts in Malaga.

**Robles-Florida, J.C.** Lecturer in Sculpture since 2019, with three six-year periods of research CNEAI, active, since 2019, Director of the Department of Art and Architecture of the UMA. My artistic research is concerned with making visible the conditioning factors of the formation of desire to elaborate strategies for approaching the Other in the current moment of mass media globalisation of culture. Through photography, video, sculpture and intervention in public space, I open a reflection where the contemporary multitude inhabiting is the protagonist.

# Archiving the Expanded Animation Symposium: Challenges, Solutions and International Collaborations

**Juergen Hagler**

University of Applied Sciences Upper Austria  
Upper Austria, Austria  
juergen.hagler@fh-hagenberg.at

## Abstract

The Expanded Animation Symposium, an annual symposium at Ars Electronica, has addressed computer animation in the context of media art since 2013. Based on the early discussions at the media festival and in conjunction with the Prix Ars Electronica's category Computer Animation, the symposium tackles animation at the intersection of art, technology, and society. The symposium serves as a hybrid between practice and theory and features talks, panel discussions, workshops, and artist presentations at various venues (i.e., museum, university, festival, cinema). 164 international experts presented and discussed current positions and future trends in the last nine editions. Due to the pandemic, the previous two editions took place online. All these activities have been documented and archived in various forms. This paper discusses challenges and concrete proposals for archiving the Expanded Animation Symposium and collaborating with Ars Electronica's archive and international partners.

## Keywords

Expanded Animation, Symposium, Digital Art, Media Art Histories, Archive, Museum

## Introduction

Animation has become a pervasive element in contemporary moving image culture and in our daily lives [3]. Since the digital shift, the manifestations of animation have expanded, and the definitions have become unstable. Meanwhile, moving pictures created with computer technology constitute a very diverse spectrum, particularly in hybrid forms, and are products of highly interdisciplinary collaborative activities of individuals from the worlds of art, industry, research, and science. Over the last 40 years, Ars Electronica (AE) has tackled this issue and discussed animation in the context of media arts [7]. Since 2013, the University of Applied Sciences Upper Austria, Hagenberg Campus, and AE have organized the symposium *Expanded Animation* (EA) [5] which aims to address the traversal of borders, hybrid forms, and fringe areas within the field of computer animation. This paper summarizes the examinations presented in the nine symposium editions and discusses challenges and concrete proposals archiving these various activities and collaborating with AE's archive and international partners.

## Expanded Animation Symposium: 2013–2021

In keeping with the motto *Mapping an Unlimited Landscape*, the EA Symposium was established to reflect on the traversal of borders, hybrid forms, and fringe areas of computer animation and continued the ongoing examination at the AE festival. The point of departure was the early discussion on media art and expanded cinema [14, 11] and the current examinations on experimental and expanded animation [10, 9, 3, 15]. The first symposium took place at the art museum LENTOS Linz as a small event in AE 2013 with a line-up of 10 speakers and three panels. Keynote speaker Suzanne Buchan started this examination by introducing the concept of *Pervasive Animation* [3]. Originally designed as a unique event, it has become an established part of the festival. Since 2014, it has been organized in cooperation with AE and serves as an academic component of the Prix AE and AE festival, featuring scientific, curatorial, and artistic perspectives. After two sessions, the symposium was first hosted under the umbrella of the AE animation festival, and together with the Prix Forum, it expanded to a two-day event. The subsequent three editions investigated the utilization of hybrid techniques and technologies, future interfaces in animation, and artistic approaches from various perspectives. The seventh edition, entitled *Out of the Box*, explored the roots of expanded animation and cinema. In 2020 the symposium bared the title *The Appeal of Analog* and addressed the attraction of animation in the context of performance, interaction, computer games, and audio. Due to the COVID-19 pandemic, the media festival and thus also the symposium took place in virtual space. Since 2020 the event has been a 3-day event dedicated to examining the interactions between animation and audio from a scientific perspective. In cooperation with the University for the Creative Arts, Farnham researchers and artists were asked to submit contributions on the subject of *Synaesthetic Syntax*. This scientific/artistic survey was kicked off by the media artist Rose Bond in 2020. The keynote speaker at the second edition in 2021 was Refik Anadol. The latest edition continued as an online event and investigated current processes of change in the expanded field of animation under the motto *Tectonic Shift*.

## Retrospect and Perspective

The EA Symposium featured 164 experts from various fields, from animation, art, games, and science (see figure 1) in the

last nine years. The symposium is open to experts in theory and practice, including the Prix Forum, featuring the top prize winners in the category Computer Animation. As at the first conferences on computer animation at AE in the 1980s, practice and theory are equally important [1]. Although the line between practice and theory is always fluid, most speakers are active in both areas. The EA Symposium picks up the idea of the initial conferences on computer animation at AE, fosters the interplay between science and practice, and seeks for artistic congruities. The symposium serves as a hybrid between practice and theory that is open for a broad range of science, from humanities to applied and multi-disciplinary sciences, covering panels in media arts, animation, and film theory as well as computer science. AE animation festival represents a unique position within the international animation festivals, as its roots are in media arts and the focus is on computer animation. The symposium addresses the interaction between art theory, and industry. Since 2016, the panel *Art & Industry* has featured artists and design studios that are active in both areas. Therefore, the center of interest is the reciprocity between independent artistic projects and commissioned works.

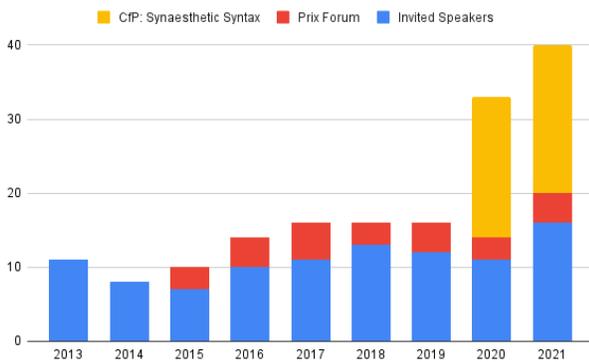


Figure 1: Participants at the Expanded Animation Symposium 2013–2021.

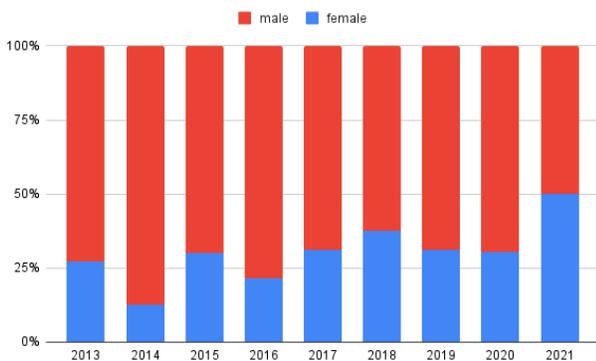


Figure 2: Gender ratio at the Expanded Animation Symposium 2013–2021.

In 2019 we released the anthology *Expanded Animation. Mapping an Unlimited Landscape* [7]. The book features contributions from speakers and artists form the first six editions of the symposium. In consideration of the hybrid format of the event, the book covers articles, essays, and a selection of current artworks, including the prize winners in the category Computer Animation at Prix AE. This anthology makes its contribution by summarizing these studies and examinations, although the selection presented here can only give limited, though essential, insights into the discussion. In addition to the book, the EA archive provides a video documentation of all talks online.

However, what is striking is that only about one-third of the speakers at the symposium are female. Furthermore, the ratio between male and female contributors at AE was not balanced at all [2], and the festival established the initiative *Women in Media Arts* [13]. The EA Symposium tackled this issue several times, and altogether, the gender balance has improved significantly over the past few years (see figure 2).

As the history of AE has shown, trends in media arts and technology come and go. Whereas computer animation was a central topic in the 1980s and 1990s in the context of media art, it gradually slipped out of focus for several years. In the last decade, animation has become pervasive. The boundaries between animation, game, film, media art, interactive art, architecture, sound art, and virtual reality are blurring more and more. At the same time, computer animation gained importance again. There has been a real boom in animation studies on expanded and experimental approaches in the last few years [12, 8], and many conferences and symposia have emerged. The EA Symposium features a unique focus on the intersection of animation and media art. In this regard, this vibrant multi-disciplinary interplay will probably spark many questions for further studies of the expanded field of animation.

## Archiving the Expanded Animation Symposium and collaboration with Ars Electronica's Archive

Since its beginning, all the activities at the symposium have been documented in various ways. The talks, workshops, and presentations have been streamed online. They are available on the symposium's website [5], at the AE archive – talks & lectures [1] and on DORFTV [4], a local community TV channel. One special challenge here was the permanent changing of the venue. The first editions took place at the art museum LENTOS Linz, others at a former cinema, at the University of Applied Sciences Upper Austria, Hagenberg Campus, at the AE festival area and at the AE museum. Furthermore, the symposium took place at many locations simultaneously, for instance, at the AE museum, and at the festival area. Each venue required a unique setup for the video documentation. The different formats posed a further challenge. For instance, presentations at Deep Space 8K, a special exhibition room at AE museum, or screenings were documented by video. However, these videos give insight and are not intended to archive the artwork properly. Whereas video documentation of presentations and panel discussions are partic-

ularly appropriate, archiving interactive and expanded art is challenging [6]. In 2021 an online archive was implemented at the symposium's website, including video documentation, pictures, and articles. Unfortunately, we cannot provide all materials online, due to copyright issues. Some video documentation, for instance, Erick Oh's world premiere of *Opera* or Mike Winkelmann's presentation of his *Everydays* at Deep Space 8K, are exceptional because of the unique setting at the AE museum (see figure 3). Furthermore, in the course of the pandemic, the symposium was streamed via YouTube, and the video archive moved from vimeo to YouTube. In addition, the symposium was hosted on Mozilla Hubs in 2020. This platform was found inappropriate for such activities and has been rejected since then.



Figure 3: Beeple — Matthias Winkelmann presenting the project *Everydays* at Deep Space 8K, Ars Electronica 2019.

## Conclusion

To document and archive a media art symposium that started as a small event and emerged to a vivid collaboration between a media festival, a museum, and international partners, we recommend following a broader approach (i.e., website, video & image archive, publications) and start documenting from the start. The symposium's website features the current edition and provides a comprehensive archive. In addition, the video documentation is available on AE's archive and DORFTV. The anthology *Expanded Animation*, available on the festival's archive and the symposium's website, serves as another form of archiving the symposium, including links (QR code) to the online archive. In addition, the symposium is featured in the annual AE festival catalog. The *Synaesthetic Syntax* conference complements the symposium with a more scientific chapter. Proceedings are in the planning and will be archived on the website. Archiving all these activities is

quite challenging due to the symposium's hybrid format. Dissemination and archiving on various platforms have proven to be particularly suitable. The website is the central hub, connected with AE's website and other online video sharing and social media platforms. This very broad-based strategy enables wider dissemination, increases the chance that the documentation will still be available in the future and the connection to the AE archive opens the door to one of the most extensive media archives.

## Acknowledgments

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## **Author Biography**

Dr. Juergen Hagler is an academic researcher and curator working at the interface of animation, game, and media art. He studied art education, experimental visual design and cultural studies at the University for Art and Design Linz, Austria. Currently, he is a Professor for Computer Animation and Media Studies and the head of studies of the degree programme Digital Arts at the University of Applied Sciences Upper Austria, Hagenberg Campus. Since 2014 he is the co-head of the research group Playful Interactive Environments with a focus on the investigation of new and natural forms of interaction and the use of playful mechanisms to encourage specific behavioral patterns. He has been involved in the activities of Ars Electronica since 1997 in a series of different functions. Since 2017 he is the director of the Ars Electronica Animation Festival and initiator and organizer of the Expanded Animation Symposium.

# Public Library Consoles – Publishing Collections with the Flick of a Hand

Dr. Dan Norton

ADEMA University School, University of the Balearic Islands (UIB)  
Palma de Mallorca  
d.norton@eua.edu.es

Dr. Fernando Vilariño Freire  
Computer Vision Center  
Barcelona  
fernando@cvc.uab.es

## Abstract

A series of consoles have been developed to investigate the sharing of digital collections in public libraries. The interfaces reduce in complexity throughout the study to facilitate ease of access whilst maintaining playability and engagement. Interaction in the final interface is sufficiently simplified to enable browsing and publishing of the collection with hand movements, using a low-cost infrared sensor.

## Keywords

Console, digital collections, publishing, online archives, crowdsourcing

## Introduction

The paper describes a series of interfaces developed for sharing digital collections in public libraries. The first is a touch screen device for combining digital objects from multiple collections, and the last is a console for a single collection, which uses hand gestures and an infrared sensor for interaction.

The research was with the Visual Interaction Group at Computer Vision Center, and testing took place in the Living Lab at the Library of Sant Cugat.[1]

## Memory Fields

The first interface installed in the Living Lab was *Memory Fields* [Figure 1]. It is a touch screen interface for two collections: A collection of posters from the Spanish Civil war, and a collection of contemporary audio field recordings from Catalunya. The interface generates dynamic audio-visual compositions on a large public display.[2] Mixing the collections generates montages,

which can be annotated and published to a new online archive.[3]

The interface was developed from an earlier artwork called *ablab*, which is a performance tool and originally shown in Electronic Language International Festival, 2004. [4] *ablab* facilitates selecting and mixing audio and visual objects from multiple online digital collections and is used for live performance as well as being installed in art galleries.[5] In a similar way to a Video Jockey or a Disc Jockey mixing live, *Memory Fields* is “performed,” in the space.



Figure 1. Memory Fields installed in the Living Lab, Sant Cugat

## Modular Testing

*Memory Fields* used five software modules for interaction with digital objects.

- A rotating graphic carousel for browsing [Fig.2]
- Slider controls for mixing and balancing audio and visual material

- Slider controls for zooming into visual material and controlling volume
- A text box for annotation
- A tool for publishing annotated material online



[Figure 2] The carousel is a valuable graphic tool for displaying and browsing collections. It combines control, play, and chance. The addition of audio effects to the rotation increases playability.

Each modular element can be separated and recombined in new configurations, and this was done for a series of workshops in the Living Lab.[6] Library users provided their own digital collections for analysis and experimentation. The reconfigured modules provided novel ways for participating in the process of presenting, annotating and adding meta-data to historical documents and contemporary collections. The process explored usability, playability, and public engagement with large scale displays.

The testing resulted in the simplification of interface design.

### Publishing by Crowdsourcing

The next interface, called *@Brossainedit*, is a touchscreen interface for a collection of over 1200 visual poems by the Catalan poet Joan Brossa, made with input from Joan Miro and Antoni Tapies. The large collection was digitized by the Museum of Contemporary Art (MACBA), Barcelona and the Joan Brossa Foundation. The console for this collection was built to engage the public directly in the act of annotating and publishing the previously unpublished collection to a new online archive. [7]

*@Brossainedit* is simpler than *Memory Fields* in that it uses a single collection with four software modules: to browse (carousel), to examine (zoom), to annotate, and to publish. The poems are published using Twitter, and include annotation, geolocation (the generated tweets include a hashtag referencing the physical place in which

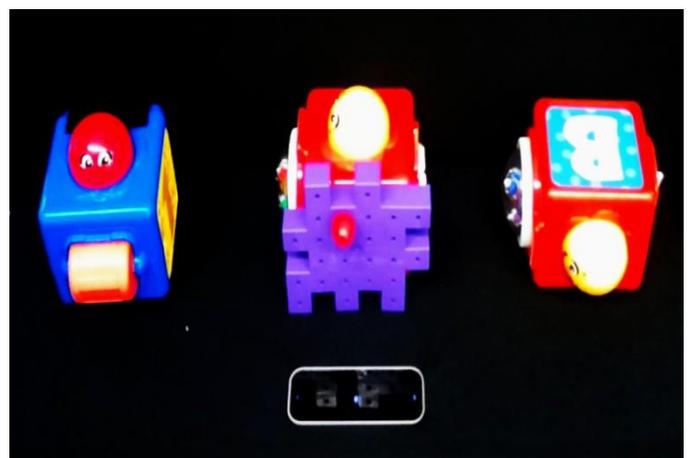
the installation was exhibited (e.g. *@Brossainedit #SantCugat*), and a date time stamp is added.

The importance of the cultural material, and the simplified user-friendly interface, increased user participation. The interface was installed in the Living Lab and also presented in MACBA and at the Mobile World Congress, Barcelona. [8][9]

### Infrared, Tangible Objects, and Hand Gestures

The simplified interaction of *@Brossainedit* enabled a final development: the expensive touchscreen interface could now be replaced with a low-cost infrared (IR) sensor.

Interaction via the IR sensor is guided by the use of four non-electronic, brightly coloured, tangible objects. [Fig.3] These objects guide the user's hand movements by providing clear interaction patterns, and the hand movements can then be interpreted by the IR sensor.[10] The objects are a cylinder that rotates, a pin-hole grid pattern, a zip, and a large push-button.



[Figure 3] non-electronic objects and infrared sensor used to monitor interaction patterns

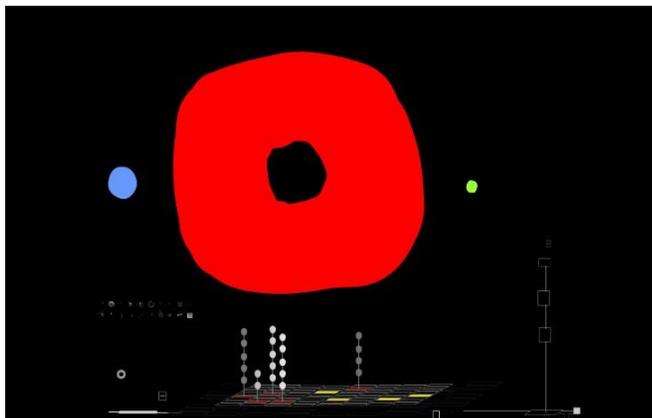
Interaction in the collection is as follows:

- Spinning the cylinder rotates a graphic carousel on screen and browses the collection. Stopping rotation selects the current image, which is displayed on screen
- Sticking a peg into the grid pattern selects a specific area of an image
- Moving the zip; zooms into and out of the selected area
- Pushing a button publishes the selected article to the new online media archive

The decision to use simple shapes for interaction originated with the aforementioned: *ablub*, which contains a

collection of brightly coloured animated objects for interacting with sound [Figure 4]. This use was further investigated by the Visual Interaction Group in a series of eye-tracking and head-tracking studies [11], which examined the value of basic shapes for use with low-cost sensors to interact in digital collections.

Providing objects with clear interaction patterns, means that little or no explanation is required for use. They provide a playful, robust, and low-cost way of introducing digital objects in public space. The use of an IR sensor reduces the need for contact with technology, which can be fragile and expensive for public use.



[Figure 4] *ablab* interface showing objects from a collection of animated shapes, which are used to generate sound.

## Observations

Selecting and mixing are two creative information behaviors. The artist John Baldessari states: “Should I do this rather than that? Should I choose this image over that one? That’s it at its heart - the artist’s role is about selection.” [12] Selecting and mixing engage the public in exploration and production and can generate insight and new knowledge simply by combining material. As Swanson observes, “The significance of the “information explosion” may lie not in an explosion of quantity per se, but in an incalculably greater combinatorial explosion of unnoticed and unintended logical connections.” [13]

Installing interactive digital consoles in local libraries creates a sense of community around collections. Interactive installations create small local events, around public displays. They create a social experience, a performance action, and a tangible exchange of knowledge and ideas around digital culture. Consoles provide curators and archivists novel activities to offer the public an opportunity to view collections and information. Collections can enter directly into the public domain. The interface systems act as a library service, whereby citizens

publish first instances online, mixed with personal annotation and metadata.

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## Authors Biographies

Dr. Dan Norton is an artist researcher and has exhibited in numerous international centers. He is coordinator of the Fine Art degree program at ADEMA University School, UIB.

Dr. Fernando Vilariño is Associate Director at the Computer Vision Center and Associate Professor at the Department of Computer Science UAB in Barcelona, Spain where he gives lectures about Artificial Intelligence, Robotics and Multimedia Systems.

# Experimental archiving. Artpool's website as a digital archive of underground art in Hungary

Flóra Barkóczy

Museum of Fine Arts – Central European Research Institute for Art History – Artpool Art Research Center  
Budapest, Hungary  
barkocziflora@gmail.com

## Abstract

The paper intends to present a unique example of digital art archiving, the experimental website of Artpool Art Research Center, an underground art archive founded in 1979 in Budapest, Hungary. The website created by one of the founders, artist György Galántai can be considered both as the extension of the physical space of the archive, and as a web-based multimedia artwork to be archived. Artpool is known as one of the largest art archives of non-official art in the East-Central European region, with a focus on experimental mediums like mail art, artiststamp, artist books, visual poetry, sound poetry, installation, or performance. Artpool.hu developed between 1995 and 2020 not only functions as a digital archive of the underground art scene of the region but also serves as an example of the experimental use of the web in the nineties, which was characterized by the positive vibes around the new political conditions in Europe and the prospect of a global network, the Internet. The underground status of Artpool has been challenged by recent years' institutional transformation, becoming the department of the Museum of Fine Arts Budapest in 2015, also affecting Artpool's digital archival strategies and online presence.

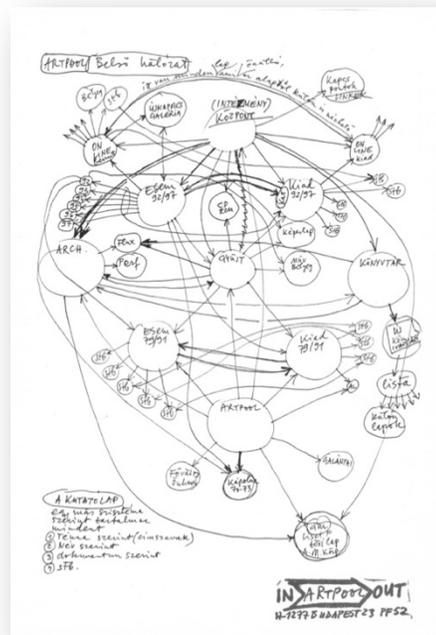
## Keywords

internet, web art, experimental art, experimental archiving, post-socialist, underground, avant-garde, musealization, self-historicization, self-archiving

## Introduction

This paper presents the potentials of an institutional website created in the nineties, functioning as a digital archive of the underground art scene in Hungary, with a focus on the experimental art practices of the 1970-80s. Artpool Art Research Center is a Budapest-based art archive, library and research center, founded as an art project by György Galántai and Júlia Klaniczay in 1979. The establishment of

Artpool is tracing back to the founders' activity in the international mail art network started in the 1970s, as well as to the intention of collecting and documenting the non-official art scene in Hungary under the socialist regime. Artpool's mission was to provide opportunity for the presentation of works of artists working with experimental mediums, at that period not supported by the authorities of the official cultural direction. The main idea behind the operation of Artpool was the "active archive" concept developed by Galántai in 1979. According to his concept the aim of the archive is not only collecting and preserving materials, but at the same time generating new discourses



and circulating the information collected. This dynamic art

Figure 1. One of György Galántai's first sketches for Artpool's website in the 1990s. © Artpool Art Research Center – Museum of Fine Arts Budapest.

historical approach led to Artpool's 40 years long history, and characterizes the engagement towards the digital archival methods evolving during the decades.

Artpool.hu developed between 1995-2020 was the first website of art institutions in Hungary. The nineties are known as a period not only characterized by the techno-optimistic vibe around the emergence of the Internet, but also by the positive expectations towards the change of the regime in the post-socialist region. Information on underground art was hardly available publicly before 1989, therefore the potentials of the World Wide Web as a global network established an utopian atmosphere for artists, whose activity was formerly controlled and censored. Artpool's website illustrates the enthusiasm for developing a complex hyperlink-structure by creating a multimedia environment for artworks and information on the Hungarian and international artworld, linked to each other on several layers. Inspired by Galántai's former mail art activities, the Internet served him as a platform for communication and building networks from the very beginning. [Figure 1.] The net provided possibility for Artpool to share information on the avant-garde art of the 1970-80s, and by doing so creating the largest database of the documentation of underground art in Hungary digitally, also including the documentation of experimental practices by utilizing the multimedial potentials of the web.



Figure 2. Home page in 2015, Artpool website, accessed January 18, 2022, <https://artpool.hu/Defaultte2015.html>. © Artpool Art Research Center – Museum of Fine Arts Budapest.

This example of experimental archiving also illustrates a specific methodology of the process of self-historicizing, introduced by Zdenka Badovinac in regard of the archival practices of the post-socialist region. [1] Artpool's activity on the website can be traced back to the antecedents of the establishment of Artpool, György Galántai's Balatonboglár Chapel Studio between 1970-73, as an illegally organized hub for avant-garde artists whose activities were restricted and isolated by the socialist regime. The first unite of Artpool's archive was compiled from the materials collected at the Chapel Studio, later also shared on the website. The

Artpool website supplies several functions of a digital archive, such as the encyclopaedia, [2] chronologies ("context chronology", mail art chronology, "surveillance chronology", etc), [3] collection of bibliographies, [4] register of artists and actors of the underground, [5] and the huge amount of digitized visual content shared online. Artpool.hu is therefore not only a virtual space for sharing knowledge based on the materials of the archive, but also a platform for documenting the operation of Artpool itself, as a self-archiving method.

The current conditions of the webpage are strongly connected to the institutional transformations around Artpool over the past decades. After operating as an illegal underground project during the socialism for more than 10 years, and as an NGO for another 25 years, in 2015 Artpool became a department of the Museum of Fine Arts Budapest, as a result of the ongoing political attempts in Hungary, rendering the existence of non-governmental organizations nearly impossible. The new institutional circumstances were accompanied with the assignment of the new generation of leadership of Artpool, which together with the operation as part of a state institution has urged the renewal of Artpool's website. The new version of artpool.hu was published in 2021, however, the previous version remained available as an artwork-like page from the new site. The archived webpage is therefore not only interesting for studies of web archiving and Internet history, but also serves as an experimental digital archive of the Hungarian underground art, especially on the 1970-80s.

The renewal of the webpage was one of the first results of the musealization. Already in 2015, when Artpool became a department of the Museum of Fine Arts Budapest, Galántai released a new home page on artpool.hu with the title "After the end of history", [6] [Figure 2] referring to Vilém Flusser's essay *On the end of history*, [7] thereby reflecting on the institutional transformation also effecting the interpretation of Artpool's history. As an initially avant-garde project, Artpool was never intended to become part of a larger entity, but its existence became dependent on financial and infrastructural support.

Besides the presentation of the Artpool website as an online archive, this paper intends to reveal the possibilities of maintaining the avantgarde nature of Artpool's archive despite the ongoing institutional transformation, with a focus on the potentials of digital archival approaches. The paper builds on the hypothesis, that the challenge does not lie in the sufficient use of the digital infrastructure for archiving, but rather in the potentials of operating with an underground attitude within the contemporary digital environment. By examining Artpool's example this case study also reflects on the perspectives of digital sovereignty within institutional frameworks in the art sector.

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## Author Biography

Flóra Barkóczy is an art historian working as an archivist and researcher at Artpool Art Research Center Budapest. She is also a PhD student at the Film, Media and Contemporary Culture PhD program at ELTE Budapest. At Artpool she is responsible for the development and research of materials based on new media and digital technologies since the 1980s. She is interested in new interpretations of Artpool's presence on the Internet since the mid-nineties, as a continuation of its former networker activities of the 1970s. Her research focus includes new media art, contemporary fine art photography, and internet-based art practices from the 90s on. As a PhD candidate, she is focusing on the development of digital culture and media art in Hungary and as a broader context in the East-Central European region in the nineties and its conditions determined by the establishment of liberal democracies right after the change of the regime.

# VR as a function for archiving media arts, one example

**Predrag Sidjanin<sup>1</sup>, Luka Tilinger<sup>1</sup>, Maja Budzarov<sup>1</sup>, Nina Zvezdin<sup>2</sup>**

<sup>1</sup>Faculty of Digital Production, University EDUCONS, Sremska Kamenica, Serbia and  
//VirtualUnit – creative VR lab, Novi Sad, Serbia

<sup>2</sup>ATIproject, Pisa, Italy and //VirtualUnit – creative VR lab, Novi Sad, Serbia  
predrag.sidjanin@gmail.com

## Abstract

Many media projects done via the Internet have either been forgotten or scattered by the author's memories, notes in the print media or have simply disappeared as if they did not even exist. Some works are archived in libraries, on the websites of artists, or art associations. Data on them is scarce, however, and few can still be viewed in their original form. Through reinterpreting and media transformation, some of the works performed this way, through VR technology, can be preserved, archived, and made available to a wider audience. Currently, there is no platform for VR archiving of such performed/reinterpreted works; the existing, mostly gaming, platforms can be used for this purpose. This paper aims to show, in one example, what are the possibilities and which benefits can be obtained from such presentation and archiving of works of media art made through the Internet.

## Keywords

Internet, media arts, archiving, online writing, virtual reality

## Introduction

Many libraries, university libraries, museums, associations, collectors as well as individuals, archive digital media art. These are mostly archived websites of artists, projects, festivals and events, and often specific works of art. The goal of such archiving is to preserve works and information related to them, their public availability, as well as educational needs in the field of art. Users of these archives can search for data related to the author/authors and their field of artistic engagement and link, if any, to a specific piece. These links are often unavailable online or require an access request, and are usually not free of charge. Still, such archiving has great advantages and social justification through its possibility to preserve media art, which, generally, has an expiration date.

Today, we are one step away from a global change in the paradigm of art, which is noticeable by the fact that more and more authors are submitting their works in the form of NFTs. Art production is changing, the market is adapting, artists are focusing on new media approaches, and digitalization is inescapable. Archiving at a time of general change in the field of artistic activity has also been forced to adapt to the new conditions. One of the more recently

announced an increasingly noticeable is the unstoppable concept of Metaverse networking, where virtual reality (VR) will completely change previous experiences in creating, consuming, exchanging, and with that, the process of archiving 'new art'. Can art be new? This is just a synonym for something that is already visible and that does not change the essence of art, but only its present-day concept.

More and more artists will turn to the realization of their ideas for the needs of this new paradigm. VR already today enables online painting, the creation of free sculptural forms, the performance of theater plays, etc. Archiving such works in a newly created context requires accelerated adaptation and solutions that will help preserve global production. Everything is changing quickly, and it is necessary to look at areas that have already been adapted, such as the field of video games. Platforms for VR games (SteamVR, Oculus Store, etc.) have already been created due to their immense commercial demand. Still, there are no platforms for archiving artistic VR works, and most of the works are either not widely available, or are placed on gaming platforms.

## VR in the archiving function

Virtual reality represents objects, situations, or phenomena through computer-generated data by the models. [1] According to Rheingold, VR enables simulation or dynamic modeling, the art of creating a simulation with certain rules, simulating different situations, to see how the system reacts as a whole. [2] These examples show the possibility of VR to generate simulations for industrial processes, scientific research, education, different types of training, entertainment, gaming, creative artistic process, etc. Along with that, VR is being increasingly used for theatrical research, since the theater is also a medium of illusion. [3] VR is becoming more widespread and attainable to a wide range of users with more affordable equipment, the quality of which is improving constantly.

In the context of modern reality, like NFTs or the Metaverse, it is necessary to regulate many things related to the VR – from copyright protection to the possibility of VR archiving, i.e., professional preservation of some selected works, which should be publicly available to a wide range of users. Among other things, it is necessary to archive the

artifacts of new media art production. Oliver Grau defines new media art as a comprehensive term that encompasses art forms that are either produced, modified, and transmitted using new media/digital technologies, or, more broadly, using new technologies derived from scientific, military, or industrial contexts. [4] He also sees that the art of new media calls into question the very foundations of object-centered understanding of art, especially its characteristics of interactivity, nonlinearity, immateriality, and transience, along with its intricate interrelationships between the artist, art, and observer. This type of art production is very diverse and, according to Grau, includes virtual art, software art, Internet art, game art, glitch art, telematic art, software art, bio-art, computer animation, interactive art, and computer graphics, as well as practices in the field of art and activism, such as hacktivism and tactical media. The question is how to archive such different media productions in VR and what is its intention? The intention of VR archiving is not only to protect or classify selected new media art projects, but also to refresh them with the possibilities that VR enables. With its availability to a wide field of users, such archived works gain a new dimension and liveliness. The possible concept of archiving in VR is based on these premises.

### VR archive - concept

The primary concept of VR archive is based on four steps: 1) selection of new media artwork that needs to be archived, 2) preparation and adaptation phase, 3) archiving, and 4) accessibility to users, Figure 1.

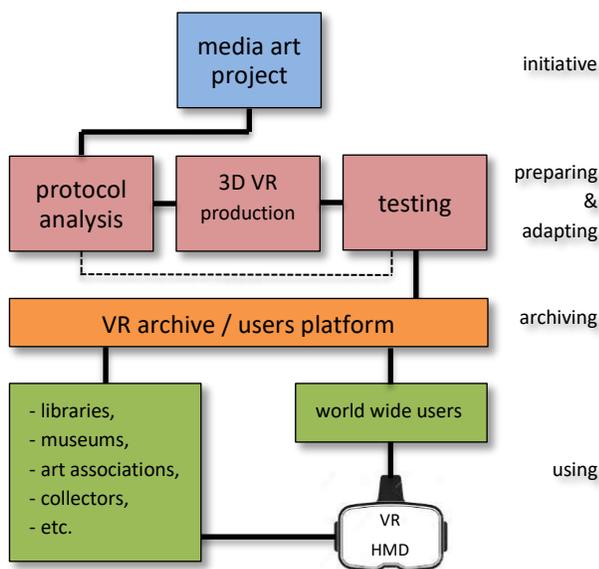


Figure 1. Workflow from initiative to archiving new media art and associability for users via the Internet

The first phase refers to the selection of work to be archived. There are two options – directly transferred work as it is for its use in the VR, or adapting to the needs of use in VR. In

general, the selected work should be digital, interactive, spatially defined, and have enough data to be used for its direct ‘introduction’ or adaptation to the VR medium. The next phase is to analyze the existing work in all its protocols related to functionality, media characteristics, duration, specifics, etc. This is the basis of the next phase of VR production, such as 3D modeling, creation of given functions, programming, rendering, sound processing, etc. In this phase, the work is tested and, if necessary, corrected to complete satisfaction and compliance with the selected original work. The work prepared in this way is ready to be published on the VR archive platform. The last phase is the public availability of archived work. Libraries, museums, art associations, collectors, as well as all interested individuals from all over the world, can access the work with approval or compensation, in cooperation with the copyright owner.

As already mentioned before, there is no VR platform for archiving new media art at the moment, so it is possible to use the existing gaming platforms, with certain specifics. The technical solutions of the concept of VR archives platform of new media art exceed the level of this paper, and we would not dwell on them here. Instead, here will be given an example of preparation and adapting an online writing performance for the VR archive.

### Reinterpreted media artwork for VR archive

Here will explain the phases of a possible concept of archiving a new media art project on the Oculus App lab platform, which at this time can be used for archiving and public availability to users around the world.

Due to its historical and media significance and specificity, the work ‘Spiral of Words’, realized in 1998, was chosen as a case study of this work. This was an ‘online writing performance’, performed from three locations, by three authors, in real-time via the Internet. The authors sent their creative texts by e-mail in a precisely defined time rhythm to the recipient’s address. It was an event called ‘The Academy of Noble Skills’, which took place on the slopes of Sunny Valley on Fruška Gora, near Novi Sad, Serbia. The documentation on this project was in a book published by the ‘Academy of Noble Skills’, as well as from the author’s archive. [5] The authors built a ‘spiral of words’ by alternately sending textual narratives, which were dedicated to one of the philosophers (Hamvas, Buber, and Berdjajev), starting with one word, then a sentence, followed by a paragraph to end the story. The texts received in this way were read directly – performed by two actresses and an actor, so that the audience had the opportunity to mentally experience the construction and enlargement of the spiral, with the help of words in a certain rhythm and time interval. The authors who participated in this project were in London, UK, The Hague, Netherlands, and Novi Sad, Serbia.

After the final selection of the artistic work for VR archiving, as a first step, its general protocol analysis was

done, Figure 2. As it is a textual narrative performed online via e-mail from three locations by three authors, the focus was on conceiving each text, defining their differences, and preparing for VR production.

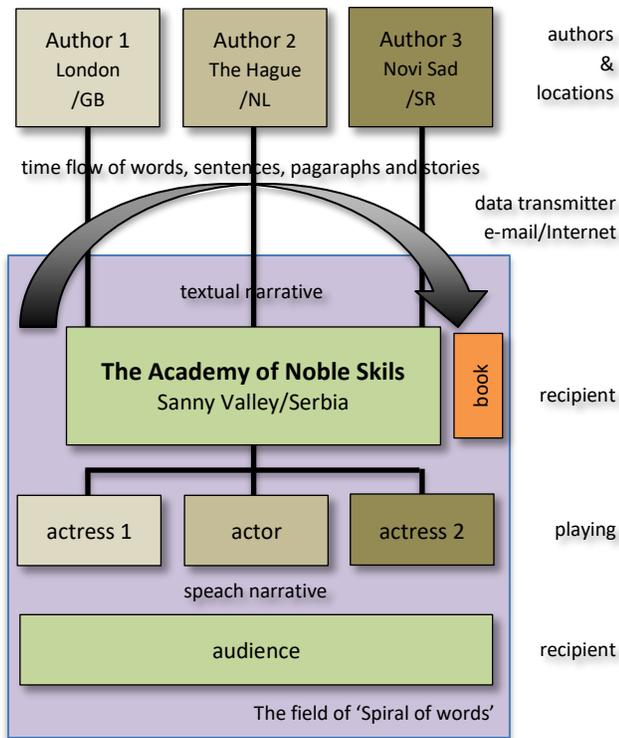


Figure 2. Scheme of the protocol analyses of online writing performance ‘Spiral of words’

After the protocol analysis, the next step was conditioned by the transformation concept of the original work and its preparation for VR production, Figure 3. The first step in the realization of the reinterpreted work for archiving and use in VR was the mathematical definition of the partial appearance of words, sentences, paragraphs, and stories. This was followed by programming in the C# language. After the first testing of the program code in VR, the project was advanced to defining specific VR functionalities, such as the use of controllers, navigation, selection of handles, editing of selected words, sound signals, etc. This was done with the combination of Unity 3D game engine and C# programming. Testing followed, then corrections in code and functionality, then re-testing. In the final phase, specific, symbolic visual effects were added for certain words, such as the word God, where the selection activates a strong light effect.

When the reinterpreted work was fully prepared and compared with the original piece, the project *build* was sent for verification to the Oculus App lab. After their positive response, the VR reinterpreted ‘Spiral of Words’ is automatically archived, posted on the Oculus App lab platform, and thus made publicly available.

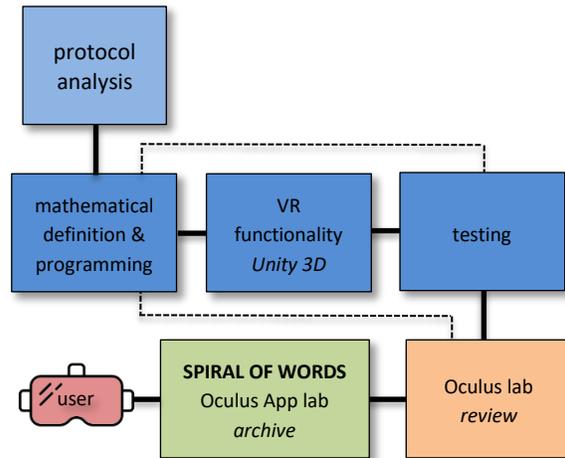


Figure 3. Time flow process from the protocol analysis phase to the final users' stage

Downloading the archived project ‘Spiral of Words’ from the Oculus App lab platform can be accessed through their browser, and from a direct link or QR code from the //VirtualUnit website<sup>1</sup>. The artistic VR project ‘Black Carbon’ has also been archived on the Oculus platform<sup>2</sup> and is publicly available.

When those interested who want to join the ‘Spiral of Words’, through their Oculus Quest 2 HMD sets, download the project to their device and put it on their heads, the construction of a virtual word spiral begins. Users actively monitor the spiral by reading the text that appears in front of them, or, more precisely, around them, since the users are in the center of the spiral. The color of the parts of the text signifies belonging to a different philosopher: **red** – Hamvas, **blue** – Buber, and **orange** – Berdjajev. Through the controller, users have free movement and navigation. It is also possible to be creative, to choose one word at a time from the spiral with the help of the controller. The source of the words is limited. With a total of 4578 English words, of which about 1000 are unique, the users are free to create their poetry, short story, or just play with them. With its selection, each word appears on a transparent "board" directly in front, but just below the user's eye line, and in whichever direction they move, it will be visible to them.

<sup>1</sup> <https://virtualunit.org>

<sup>2</sup> <https://www.oculus.com/experiences/quest/4188524877934961/>

The selected words, Figure 4., in the new textual meta-narrative can be edited directly, via the controller, on the board in front of the users, i.e., change their order.



Figure 4. Selected words for creating meta-narrative appeared on the transparent board in front of a user, ready for direct editing

This would complete the reinterpretation of the original 1998 project, but a step further was adding effects to individual, pre-selected words, which are based on the symbolism or direct information assigned to that word. That is a strong influence and feature that is close to theatrical and performing arts. These give the users an extra level of fun because they get unexpected and surprising visual and sound effects, Figure 5.

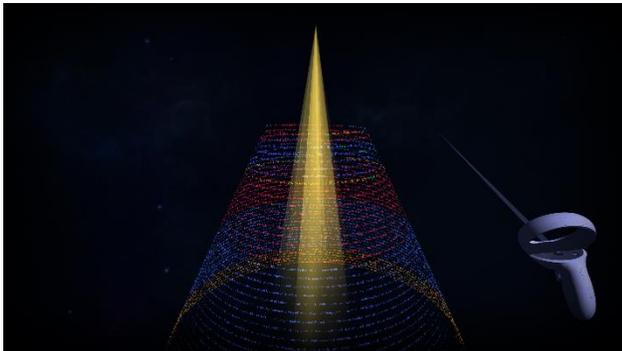


Figure 5. The visual and sound effects when the word God is selected

## Conclusions

This paper presents a possible concept of archiving new media art in VR. For now, such a VR platform for archiving does not exist, but existing gaming platforms can be used instead. A case study presented, as an example of reinterpretation, preparation, and adaptation of an e-mail online writing performance, for archiving and use in the VR. It has a wide field for the possibility of transformation and additional creation of previously made or performed new media art projects. VR can refresh and enliven them by interacting, changing, supplementing, or creating new

approaches within a given framework. By archiving and posting such customized and transformed projects on specific platforms for VR users, they will again be publicly available and attractive to all who are interested in them. With the announcement of the Metaverse and its establishment, it is expected that famous museums, galleries, libraries, collectors and others interested will create their VR archives and collections, and thus enrich and profile, now a quite chaotic situation related to this area.

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- Predrag S. Šiđanin, Ph.D. – multimedia artist, founder of //VirtualUnit creative laboratory for virtual reality. Dean and full professor of VR at the Faculty of Digital Production, EDUCONS University, Sremska Kamenica, Serbia.
- Luka Z. Tilinger, MA – illustrator and programmer, co-founder of //VirtualUnit creative laboratory for virtual reality. Assistant professor of gaming and Unity at EDUCONS University, Sremska Kamenica, Serbia.
- Maja S. Budžarov, MA – ceramic and multimedia artist, co-founder of //VirtualUnit creative laboratory for virtual reality. Associate professor of interactive art at EDUCONS University, Sremska Kamenica, Serbia.
- Nina Zvezdin, MArch – architect, multimedia artist and musician, member of //VirtualUnit creative laboratory for virtual reality. Architectural Intern, ATiProject, Pisa, Italy.

# Restoring the recent past: Learnings from producing a retrospective of VR content from the UK

**Aki Järvinen**

Digital Catapult  
London, United Kingdom  
aki.jarvinen@digicatapult.org.uk

## Abstract

The Immersive Arcade was a retrospective of UK-based immersive content, showcased during 2021. The project was not set up to archive the content, but to restore it for new audiences. The production team made several observations about the lifecycle of immersive content and what types of considerations regarding the identity of a piece of content emerge in a restoration process. They are documented in this short paper with the aim to inform work on future retrospectives and similar archiving and restoration projects.

## Keywords

Virtual Reality  
Archiving  
Preservation  
Virtual art  
Online museums  
Immersive art

## Introduction

The paper documents learnings and observations from a retrospective of UK-produced VR art and games, showcased in a virtual museum during 2021. The project, called Immersive Arcade, was part of a research and development programme that was supporting the growth of the creative industry employing immersive technologies, such as Virtual Reality, Augmented Reality, haptics, projection mapping, and so on. [1]

The retrospective was produced by Digital Catapult, a non-profit organisation set up to accelerate the adoption of advanced digital technologies by UK businesses. The work was exhibited in Museum of Other Realities (MOR), an online VR museum space. This paper is written from the point of view of the Digital Catapult delivery team on the project.

Figure 1. The entryway to the Immersive Arcade showcase in Museum of Other Realities. ©Digital Catapult & UKRI.



## Retrospective as a form of restoration

The Immersive Arcade (see Figure 1) was not positioned at any point to be an archiving project, because that is not in the remit of the organisations involved. Instead, it was produced with the goal of showcasing outstanding immersive content and enabling broader access to it. The aim was to bring together highly regarded VR experiences before they run the risk of being forgotten and enabling access to audiences who had not seen them, nor necessarily even ever experienced VR before. The latter goal was met by organising a tour of the retrospective across the UK. The tour specifically aimed at reaching young female audiences, with the goal of making them aware of potential career paths in immersive.

Upon reflection, however, the fact that Immersive Arcade was a retrospective, in practice meant that the production became a restoration project. Unfortunately, the project did not become a permanent archive, as it has not been available since November 2021 due to licensing arrangements.

The fact that the organisations involved were not able to continue Immersive Arcade on a sustainable basis speaks to the commercial reality of restoring technically complex and inaccessible work. In the following, we summarise some of the reasons why and believe that these insights contribute to the discussion on what types of institutions are well-placed

to run similar retrospectives, perhaps even in a systematic manner. We believe these insights contribute to discussions of new forms of archiving and how to restore digital art from such archives for future audiences.

### **Content lifecycle as an archiving constraint**

The first observation has to do with the lifecycle of VR content and who owns it. Because Digital Catapult, nor the funding body (UK Research and Innovation), are not a heritage or museum organisation, acquiring the intellectual property with perpetual rights was not an option.

Consequently, licensing the content become the only feasible way forward. What we found entering these discussions with the content creators was that given the relative recency of the content, they saw that their intellectual property still ‘had legs’ commercially and hence were happy to agree to a time-based licensing deal that we offered. In other words, in terms of their lifecycle, the projects were not yet ready to be archived.

Due to budgetary considerations, it was necessary to phase the retrospective into three volumes, so that licensing costs per individual project could be limited, yet more projects could be included in total across the six months that the Immersive Arcade was open to the public.

While archiving the content for permanent access was never our goal, this sequence of events highlights an interesting aspect of the state of the immersive content domain: institutions intending to practise archival and collection in a commercially underdeveloped space, such as immersive, need to set their expectations and historical focus carefully.

### **Technical process**

From a technological point of view, our work started with the assumption that a software project, likely developed with a real-time game engine (Unity or Unreal) would be available for each piece of licensed content. Or, in the case of 360-degree video content, a media file was required to be available.

The responsibility to deliver the executable was on the original content producers and IP holders, in dialogue with the Digital Catapult delivery team and the MOR technical team. Due to how the project was set up, there simply was no time to spend reverse engineering executables. This was an advantage that we might not have had with less recent projects.

Once the executable was received according to specifications, it was embedded to the Museum of Other Realities VR application (that runs on PC-tethered VR headsets and is available to download digital distribution platforms, such as Steam and Viveport).

### **Technical challenges from UX to versioning**

The process described above mitigates many challenges, such as third parties accessing software projects originally created by others and trying to migrate them to another software environment. Many of the technical restoration challenges regarding VR applications discussed by Ensom and McConchie [2] were not an issue for the project.

Regardless, other types of issues emerged. While we were not expecting a completely smooth process, the challenges tended to be of the type we did not foresee.

For example, user experience inconsistencies emerged: even as recent as five-year old VR projects caused extra integration work so that they could be showcased next to others with a consistent approach. A project in the retrospective had been developed at a time when conventions for configuring VR controllers’ interaction schema - i.e., what button or trigger is used for teleportation or selecting an object - were not yet established. The project in question used a somewhat unconventional method. It did not work satisfactorily with the latest and most widely adopted standalone headsets without additional work.

Another piece of work had successfully extended its lifecycle after initial launch by versioning: there was an original interactive six degrees-of-freedom version, but also a 360-degree video version aimed at audiences with less powerful headsets. Our intention was to showcase the work in its original interactive format but in the end, we never managed to get access to a working build that would have fit the exhibition platform.

In discussing the challenges of documentation and restoration in the context of installation art, scholar Annette Dekker mentions how at times ‘where to locate the work’ can become a problem for restoration [3]. For us, this was a concrete issue.

### **Negotiating the work’s identity and creative control over it**

The above two anecdotes serve to illustrate what can happen with a piece of standalone content that was originally developed with the same technology, in this case VR, only few years apart.

Besides licensing and technical aspects, we also came across challenges that had to do with the identity of the original work and how to maintain the creative vision in a new exhibition context.

The overall curation process of the retrospective became a negotiation of what was available and what we wanted to include. Our aims were ambitious in that we were also looking for ways to include content from projects that were originally ran as location-based installations, with VR content as segments in a larger physical whole.

From a practical point of view, this presented a challenge in terms of what to include into a ‘vertical slice’ of history. It was an exercise in rescoping the content in the face of a different distribution opportunity.

From a theoretical perspective, we were negotiating what the elusive essence of the work was, and how its identity was bound to change when restaged for the retrospective. In this case, we supported the original creative lead in making the decisions. As a result, the output was not compromised but rather a reimagination of the original work.

However, we learned that one cannot expect such flexibility from all creators. Some of them demanded a level of control that we could not give, due to the technical restrictions of the platform. This was understandable but did mean that some flagship content from the UK was left outside the retrospective.

Finally, there was another aspect to restaging the work. Because the Museum of Other Realities is a virtual environment, each piece of content was accessed through a custom-made environment that was designed to reflect the theme of the content and its audio-visual qualities. In this part of restaging the work, we asked the teams to deliver assets (3D models, audio, etc) that could be included in the space (see Figure 2 for an example).

Again, we found different levels of commitment and control over this aspect. Some teams embraced the opportunity to instil creative control over the staging, while in other cases, no team was left to do it, and the MOR team worked with the assets provided to create the environment where users arrived to find the executable. In these cases, an additional approval process needed to be put in place.

## Discussion

We believe it is useful for archivists, collectors, and conservationists in this space to take note of our experiences with Immersive Arcade. The practices of licensing and restoring immersive artistic content are far from established.

It can be a miscalculation to assume that a piece of immersive content has a team still attached to it in one way or another, and necessary files and documentation have been rigorously stored. If there is a gold standard in restoring VR work, it likely is the continuous redevelopment and

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maintenance activities around Char Davies’ pioneering VR work [4]. However, it just might be a beautiful outlier in an otherwise chaotic field.

Concerning the legal aspects, a similar risk emerges from assuming that there is a clear point of contact regarding intellectual property ownership. During the production of Immersive Arcade, there were cases where the content was technically ready to go on the platform as part of the launch of the next volume, but we were waiting for the licensing deal sign-offs due to complex IP ownership structures.

To summarise, producing a retrospective of immersive content from the recent past is not only a case of restoring technology and content, but also a case of restoring creative teams, negotiating creative control, chasing access to assets, and navigating complex IP ownership arrangements.



Figure 2. Vestige room with additional assets by NSC Creative as part of the Immersive Arcade VR showcase. ©Digital Catapult & UKRI.

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# Newsslider, smart navigating archives

**Danielle Arets, Martina Huynh, Jonas Althaus, Tijmen Altena**

Fontys University of Applied Sciences, Journalism & Responsible Innovation  
Tilburg, Netherlands  
d.aret@fontys.nl

## Abstract

Currently, the potential of (media) archives in journalism is underutilized. Historical data is scarcely used to connect historical developments to current events. With the design research project Newsslider, we explore how emerging technology (artificial intelligence and natural language generation) can empower journalists to connect historical events to contemporary reporting.

## Keywords

Archives, Artificial Intelligence, Research through Design, Journalism

## Introduction

The digitization of information has created enormous data volumes in recent years. The digital archives are a rich source of information. However, their potential is often underused (Hawkins, 2021). To what extent can we mine archival information so that we facilitate journalists in using historical data to contextualize the debate on current issues better? How can AI support journalism to include traces of the past in their daily reporting?

In 2019 a research group of journalism researchers from Fontys University of Applied Sciences in Tilburg, Cream on Chrome, a design research studio in Rotterdam, ID Fuse, a Utrecht based AI-development studio, and the Netherlands Institute of Sound and Vision in Hilversum, supported by the fund for Creative Industries, embarked on a design research journey exploring the possibilities of using AI tools to unlock historical information for journalism.

In our design research project, we explored three topics: The German refugee crisis, Brexit and Climate Change. All themes are frequently in the news - and are expected to remain topical for some time to come. Moreover, a historical context is crucial for these themes to interpret and understand the current events and future developments.

Utilizing a mixed method approach (Creswell, 1999), we combined Critical Discourse Analyses (CDA)(Fairclough, 2001), sentiment analyses using automated text mining, And named entity linking, and research through design (Stappers & Giaccardi, 2017).

## Critical Discourse Analyses

For the first case study, the German Refugee crisis, we researched how German chancellor Angela Merkel's much-cited phrase "Wir schaffen das" ("We can do this") was portrayed in the German newspaper Süddeutsche Zeitung between 2015 and 2018. As a result, this sentence became a touchstone for migration politics in German media.

Utilizing Critical Discourse Analysis, we came to understand that within three years, the meaning of the famous quote shifted fundamentally: In 2015: "We (the European Union) can help refugees currently stuck in Hungary" to 2016-2017 "We (German citizens) can help accommodate refugees by making an extra effort" to "We (the German economy) must integrate these refugees and give them all a job" in 2018.

The CDA gave a clear insight into how discourse is changing against the backdrop of social, cultural, and political change. The message Wir Schaffen Das thus takes on a new charge.

## 4-D News installation

To explore how audiences value and interact with this contextual information, Cream on Chrome translated the insights into 4-D News, an exhibition piece that allows visitors to pull up or down a physical scrollbar. Visitors can explore bits and pieces of the original 30 newspaper articles that appear, disappear, and replace each other, thus revealing different sentiments and framings in different times. In correspondence, a small monitor displays the everchanging definitions of "WE", "CAN DO" and "THIS", systematically revealing shifts in public discourse. The 4-D News installation was exhibited at Z33 House for Contemporary Art, Design & Architecture (BE), BIO26 Design Biennale (SLO), Dutch Design Week (NL), and at Hamburg Museum of Arts and Crafts (DE). The

installation was actively used in the exhibition and visitors reported gaining a better understanding of the German Refugee Crisis through interaction with the exhibition piece. The playful interaction with time and seeing the subtle shifts in discourse were specially mentioned as a valuable way of providing information. The installation also aroused interest among media organizations and journalists, who saw opportunities to contextualize the news better in the four-dimensional news space.



Figure 1. 4D News installation by Cream on Chrome.

### AI Analyses

In a follow-up study on the topic of Climate Change and Brexit in 2020, we decided to translate the physical installation into an online tool that would encourage wide use and could potentially support both journalists and researchers in their work. This involved partnering with ICT studio ID Fuse, and Clariah Mediasuite, the archive of the Netherlands Institute of Sound and Vision.

The Media Suite is an innovative digital research environment, that allows researchers to explore and experiment with multimedia data collections. With advances in Natural Language Processing and Artificial Intelligence driven methods of extracting information and correlation from textual data, ID Fuse expanded from the above-described process by comparing related keywords to track changing terminology and complex modes of data analysis.

Using these AI-driven methods, we mapped the changes in the climate and Brexit debate. We displayed the tracked information on a timeline, indicating different terminology, sentiments, and important iconic images on the time axis. This provides an overview of how both debates change over times.

The smart technology search options were incorporated into a simple design interface by Cream on Chrome. The Newsslider tool allows users to enter a search term, for example, climate change. Based on named entity linking-where AI intelligently searches the archive and tracks common word combinations (acid rain, emission rights,

ozone layer)- related search terms then appear. Next, a timeline shows how often these terms have been used over time. The polarity of these themes is also displayed. Finally, the timeline shows image fragments that have had a substantial impact on the debate, such as a UN climate conference, Greta Thunberg's speech or a climate demonstration.

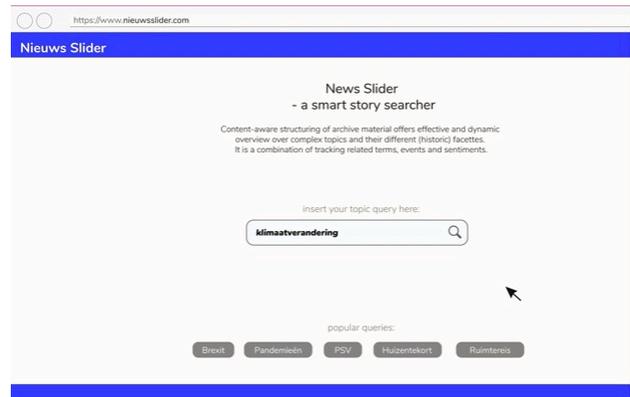


Figure 2. Online tool Newsslider

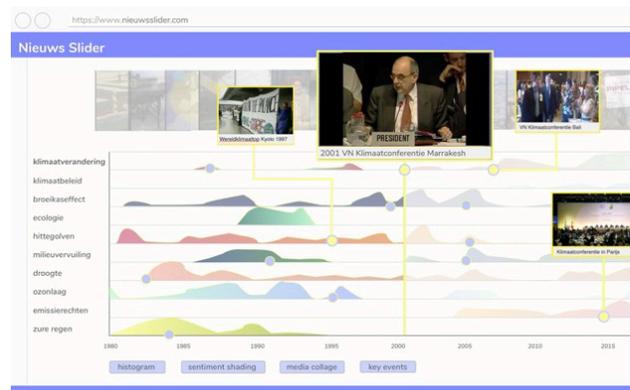


Figure 3. words linked to climate change, overview of sentiments and iconic images

### Design Sessions

During the development of the tool, we conducted four design sessions using context mapping (Visser et al., 2005)- to explore how the tools can be meaningful to (investigative) journalists and researchers. Participants were asked to construct a view on the climate change debate where they share both ideas of the past, the current situation, and dreams of how a future debate could be reported upon.

We organized four context mapping sessions with:

1. Three chief editors and four journalists of regional

and national news outlets

2. One chief editor and three investigative journalists of a public broadcaster
3. Six academic researchers on climate change
4. Four journalists of regional outlets and five ICT experts of Fontys University of Applied Sciences

In these sessions, we had participants experiment with historical data themselves, reflecting on how they currently incorporate historical information into their work and the methods used to do so. We then had them experiment with the Newsslider tool, engaging them in a conversation about how this service could be meaningful in their daily or future work. We ended the sessions by identifying opportunities for integrating the Newsslider tool into daily operations.

### Insights

We came to understand that the tool is meaningful for journalists as it gives a clear overview of how sentiments change over time. Journalists say that they can provide better interpretation with these insights.

*“This allows us to contextualize the news better and give a positive outlook on topics discussed in more nuance today. The tool shows we do make progress.”*

*“It also gives us as journalists good insights into ways in which the narrative is changing and how we can continue to question it in our research and interview process.”*

The data journalists also mentioned that the tool is helpful as the named entity linking gives a quick and lucid overview of important search queries.

*“I see many opportunities for quickly mapping social media data and making smart connections in the data. That could speed up our research process.”*

The consulted academic researchers mentioned the tool could support the exploration phase of their research.

*“We already use the media suite archive for our research, but see a lot of potential in the Newsslider to quickly identify research topics. The overview of iconic images is helpful in this.”*

Furthermore, both the researchers and consulted journalists see opportunities in the tool for the dissemination of research and more public engagement in journalism.

*“I find the way you make the archive attractive to the general public interesting. The inviting design and the visual overview of historical information invites to interact with historical information.”*

*“I could imagine this could be an inviting tool for our news users to navigate our archives.”*

The insights generated from the sessions were used to develop a minimum viable product of Newsslider.

So far, the consulted climate researchers already implemented the tool in a scientific application aimed to develop new climate narratives.

The trajectory has also sparked journalistic interest in engaging with archives. The presentation of the tool to regional public broadcasters has now resulted in a follow-up study (2021-2022) focusing on the smart mining of the archive within a regional journalistic context.

Furthermore, we are exploring the educational use of the tool as a way to interest journalists early in their education in new smart search methods as well as ways to include historical data in the journalistic process

### Reflection

The thinking through making approach

(Rajmakers & Arets, 2015)- where the creation of the prototypes and the systematic reflection on them went hand-in hand, contributed to a fruitful collaboration between the disciplines (journalism researchers, design researchers AI developers, archive experts) involved in this project.

The physical installation of the Newsslider and the active interaction with the physical timeline by museum visitors was a vital step in the idea development of the Newsslider tool.

Incorporating all the complex technical AI capabilities into concrete mockups, allowed journalists and scientists to imagine how this tool could work within their own practice

The design research trajectory taught us that AI driven research methods can be meaningful for the journalistic practice. A design-driven approach in which making the research tangible at an early stage of the process, helps to understand and communicate the potential of new AI-driven research methods with journalists, chief editors and academic researchers.

Furthermore, the strong design language (tangible and visually appealing interface) contributes to a better understanding of the possibilities and the desire to interact with historical data.

To conclude, our design research shows the potential of an AI tool to better unlock the archive for journalistic and scientific purposes. Further research on how this can be applied in practice and how it results in more meaningful journalism is highly desirable.

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## Author(s) Biography(ies)

Danielle Arets is heading the Journalism and Responsible Innovation lab at Fontys University for Applied Sciences, school of journalism. She is also a researcher at Design Academy Eindhoven. In her research group, journalism researchers, designers, and ICT specialists work hand in hand, investigating technology trends and prototyping future content delivery concepts

Martina Huynh and Jonas Althaus founded studio Cream on Chrome; a socially-engaged experience design Studio based in Rotterdam. By designing multimedia experiences and interactive spaces they explore new perspectives in the fields of economy, journalism, ecology and emerging technologies.

IDfuse is the company of Tijmen Altena and Paul Tuinenburg. IDfuse specializes in the design and support of the process that brings academic knowledge to fruition

# “The Right to the Image”: Ethics of Representation and Appropriation in New Media Art Archives since the 2011 Arab Uprisings

Lisa Deml

Birmingham City University  
Birmingham, United Kingdom / Berlin, Germany  
[lisa.deml@mail.bcu.ac.uk](mailto:lisa.deml@mail.bcu.ac.uk)

## Abstract

In 2017, the Syrian video art collective Abounaddara, that earned international acclaim for documenting Syrian life amidst conflict, removed the vast majority of its videos from their Vimeo archive in response to what it regarded as their improper use by the Triennale Milano. Curator Massimiliano Gioni countered that the exhibition only made available material that was already in the public domain and that underscored the Triennale’s commitment to Syrian migration struggles. This case illustrates ethical concerns regarding authorship, authority, consent, and copyright that permeate the presentation of openly accessible digital media archives as part of international art exhibitions—which are exacerbated when they pertain to representations of conflict and violence. Now more than ever are we in relationships of moral, affective, and material intimacy with violence, and this calls for a reconsideration of how our senses are solicited by and implicated in the conduct of conflict. Taking Abounaddara’s video art archive as a point of departure, this paper discusses practices of engagement that can respond to the growing demands and responsibilities inherent in new media art archives of conflict and violence.

## Keywords

Ethics of appropriation, representation of conflict and violence, 2011 Arab Uprisings, Abounaddara, authority, authorship, consent, copyright, public domain

## Introduction

In the wake of the 2011 Arab uprisings, the widespread hope in the democratic potential of the digital spawned numerous crowdsourced new media art initiatives to challenge archival authority and ideological narrativization commanded by state institutions and global news networks. Yet, while the capacities of the internet have enabled recording, sharing, and archiving the revolts in an unprecedented fashion, these facilities also instituted a globally dispersed reinforcement and recalibration of power, turning memory and knowledge into commodified and copyrighted goods. As Donatella della Ratta, Kay Dickinson, and Sune Haugbolle argue, the corporate online platforms and international exhibition circuits that enabled the emergence of such ‘counter-archives’ also lodge them in informational economies that inflect their liberatory

potential and render dissenting subjects and documents vulnerable to various forms of power. [1] In light of resurging protests and rising authoritarianism across the Arab region and beyond, discourses around archival repositories and historiographic narratives have acquired a renewed and contested urgency. As researchers, curators, image producers and spectators at a distance, it is essential to question prevailing patterns of recognition and representation in order to develop practices of engagement that can respond to the growing demands and responsibilities inherent in new media art archives of conflict and violence.

Since its foundation in Damascus in 2017, an undisclosed number of volunteer, self-taught filmmakers have gathered in the collective Abounaddara to produce short videos with French and English subtitles which are freely accessible on the virtual video-sharing platform Vimeo. The name Abounaddara translates to ‘the man with glasses’, both a hint towards ‘seeing clearly’ and a reference to Dziga Vertov’s seminal documentary film *Man With a Movie Camera* from 1929. Violence rarely becomes directly visible but resonates in anecdotes and stories of commonplace protagonists as well as through video collages of international media coverage and archival footage. [2] By appropriating the aesthetic and formal language of documentary film, Abounaddara seeks to make visible everyday life amidst the civil war. This approach is formulated in opposition to the economy of news gathering and the instrumentalization of citizen journalist practices that went hand in hand with the militarisation of the Syrian conflict. Through processes of anonymization and the display of an increasing level of violence and suffering, ‘the Syrian has been transformed from a dignified revolutionary into a victim who provokes only sorrow or disgust.’ [3] Accordingly, this has led to ‘an unprecedented banalisation of evil,’ that leaves the audience barely ‘a choice between indifference and compassionate voyeurism.’ [4] The collective asserts that, ‘if Syrian image makers want to reinstate the dignity of their compatriots, they must seize the means of production of their own image’. [5] Thus, it is a key concern for Abounaddara to maintain the position of both author and producer of their work.

However, in 2017, the Triennale Milano featured Abounaddara's video art archive as part of the exhibition *La Terra Inquieta (The Restless Earth)*—even though the collective had explicitly declined the presentation of their videos in this context. Their refusal was grounded in the fact that they considered the Triennale's focus on the plight of Syrian migrants and refugees opportunistic and did not want their work to be subsumed under a politico-aesthetic discourse which privileges a Western point of view. [6] When the collective became nevertheless aware of the presentation of their video archive through reviews of the Triennale, they asked for the installation to be removed—a request that was only granted following public outcry. Curator Massimiliano Gioni insisted that the exhibition simply made available monitors connected to the Vimeo archive which was already in the public domain. While he acknowledged the ways in which Abounaddara is reframing issues of authorship and distribution, he questioned the collective's position on maintaining control over their videos, 'that is more restrictive than their own work would seem to suggest.' [7] To this neglect of authorship and abuse of copyright, the video collective could not resign 'except to renounce our fight for the right to the image.' [8]

In effect, the case of Abounaddara serves as a mirror image of our representational apparatus, extending the hegemonic viewing patterns that underlie global news networks to international exhibition circuits. In contemporary art spaces, their videos are framed as raw material for pedagogy and presented as instruments to facilitate ethical responses. As such, the Triennale reproduced the very power structures it sought to criticise, reflecting the sensorial-material infrastructures that perpetuate spectacles of indignity and that fold us as global spectators into complicity with conflict and violence.

I cannot purport to occupy a position outside of the digital sensorium that makes such patterns of viewing and structures of feeling possible. As Asma Abbas has noted, liberal societies are sustained by an uneven distribution of pain between those who suffer and those who are solicited to redress that suffering. The solicitations of empathy, sympathy, and compassion offered by humanitarian art forms thus confirm, rather than challenge, this uneven distribution of suffering. [9] With Daniela Agostinho's words, and in more materialist terms, 'the plight of others is not a mere object of representation, but the very material condition that makes such aesthetic forms possible.' [10] Moreover, Christina Sharpe argues that the incessant circulation and repetition of images of distant suffering as well as their formalisation in aesthetic and art practices do not lead to a cessation of violence but often 'work to solidify and make continuous the colonial project of violence.' [11] Sharpe urges us as distant spectators to think about what these images call forth, to think through what they call on us to do and feel—and how we might be able to refuse the positions and feelings solicited by humanitarian art forms.

The technologies of war connect us across the globe through virtual networks in everyday digital environments and create invisible infrastructural proximities. Now more

than ever are we in relationships of moral, affective, and material intimacy with distant conflict and violence to the extent that we are always embedded and sensorially implicated in the cruel images they convey. This prompts us to consider scale differently, in that it compels us to ask 'whether one can be intimate with the far away, across distance and incommensurability.' [12] Yet, I do not want to suggest that the digital connection provides at the same time social, cultural, or emotional connection; my point is that we require an ethical understanding of distance and proximity if we are to create and sustain a sense of each other sufficient not just for reciprocity but for a duty of care and responsibility. This is to say that our relationship to conflict and violence goes beyond the question of seeing or "looking away"; in an intensely and extensively mediated global world, we are always in relation with their cruel images—even if we do not see them.

To challenge hegemonic and algorithmic infrastructures of knowledge production and dissemination, a still growing number of citizen-led initiatives to archive the 2011 Arab uprisings claim and insist on the right to intervene in and act upon the reservoirs of collective memory. Appropriating the predictive function of the archive as a technique of power, these crowdsourced archives subvert the aesthetic, economic, and geopolitical systems enabling or impeding certain images and protagonists to appear on the plane of the visible—and thus to come into being in past, present and future. This proliferation of citizen journalist media and the concomitant rise of crowdsourced new media archives in the wake of the 2011 Arab uprisings prompt us to reconsider our spectatorial positionality and archival agency. In doing so, the space of image production and reception can expose epistemological gaps in digital and datafied repositories, sensualise what has been abstracted, reconfigure what counts as an archive, and imagine new forms of accountability from within the aesthetic field.

Taking Abounaddara's video art archive as a point of departure, this paper addresses ethical issues that permeate the presentation of openly accessible new media art archives as part of international art exhibitions—which are exacerbated when they pertain to representations of conflict and violence. The presentation will unravel the network of relations between image producers, image protagonists, and image spectators as they converge in crowdsourced archival initiatives, and will retrace the negotiations of authorship, authority, and agency along the shift from online platforms to cultural spaces. From a self-critical and self-reflexive perspective, I want to question patterns of recognition and representation in order to expose curatorial and spectatorial processes that might reproduce the very power structures they seek to criticise. In doing so, my paper aims to untangle the complex correlations between the public domain, artistic and moral rights, and ethical concerns and responsibilities as they are epitomised in Abounaddara's 'fight for the right to the image'. [13]

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### **Author Biography**

Lisa Deml is a Midlands4Cities funded doctoral researcher at Birmingham City University. She holds degrees in Art History and Philosophy from the Courtauld Institute of Art, London, and the Ludwig-Maximilians-University, Munich. Initially trained as a journalist, she subsequently worked for public cultural institutions and non-profit organisations internationally, including Gropius Bau, Berlin, Haus der Kunst, Munich, and Ashkal Alwan, Beirut. Prior to her doctoral research, she coordinated the multi-year project *Afro-Sonic Mapping* as well as assisted in the preparation and implementation of the exhibitions and accompanying publications *Love and Ethnology* and *The Most Dangerous Game* at Haus der Kulturen der Welt (HKW), Berlin. Her research interests focus on visual articulations of citizenship and artistic strategies to foster transnational solidarity and resistance, particularly in the framework of documentary and new media practices in the Middle East and North Africa.

# **-Lightning Talks-**

# IMAI Play: The video art channel of the Inter Media Art Institute

**Darija Šimunović, Dr. Linnea Semmerling**

IMAI–Inter Media Art Institute  
Düsseldorf, Germany  
Contact Email: [ds@stiftung-imai.de](mailto:ds@stiftung-imai.de)

## Abstract

The Düsseldorf Inter Media Art Institute (IMAI) is a non-profit foundation that archives, exhibits, and distributes time-based media art. The archive boasts more than 3,000 works that document the international history of video art from the 1960s until today. More than 1,000 of these videos can be viewed in full in the catalogue on the foundation's website. Since September 2021, this website also hosts the foundation's participatory video art channel: IMAI Play. IMAI Play invites users to create video art playlists, publish them on the foundation's website, and share them on social media. Through social tagging every playlist is accompanied by user-defined metadata to facilitate new readings of the archive. Users can also create their personal watch lists and comment on the playlists of other users. With IMAI Play, the Inter Media art Institute aims to stimulate communication about video art and create a space for new perspectives, discoveries, and unexpected connections.

## Keywords

Video art, art history, participatory curating, digital archive, citizen science, social tagging

## IMAI Play – A participatory video art channel

The Düsseldorf Inter Media Art Institute (IMAI) is a non-profit foundation that archives, exhibits, and distributes time-based media art. The archive boasts more than 3,000 works that document the international history of video art. A permanent exhibition at NRW-Forum Düsseldorf makes this history come to life in an interactive display. The distribution program circulates videos from more than 120 international artists. More than 1,000 of these videos can be viewed in full in the catalogue on the foundation's website. Since September 2021, this website also hosts the foundation's participatory video art channel: IMAI Play.

IMAI Play invites users to create playlists from more than 1,000 works of video art from the 1970s up until today. The works include the international canon of video art history, underground music videos as well as performance documentations. To find videos, users can search the catalogue by artist name, work title, medium, date, as well as search terms related to topic or style. Any of these videos can be added to a playlist.

To compile their own playlists, users have to create a personal account free of charge. The account allows them to create a playlist and add videos, texts, and a minimum of three user-defined tags. The playlist can be kept private, or it can be published on the foundation's website as well as shared on social media. A published playlist can be commented upon and put on other users' personal watch lists.

With IMAI Play, the Inter Media Art Institute strives to liberate video art history from the confines of the strictly thematic and stylistic taxonomies of professional art historians and embrace the rich and unexpected folksonomies that emerge among the wider community of video art enthusiasts instead. The platform can thus be understood as a tool for user-defined metadata collection that provides new possibilities for citizen science in the humanities. By drawing on the expectations that users have developed during everyday interactions with commercial audiovisual platforms and streaming services, the participatory channel seeks to combine a pleasant viewing experience with a lasting contribution to art history.

IMAI Play hopes to make the archive of the Inter Media Art Institute accessible to more diverse audiences from all over the world by inviting them to view video artworks, create their own programs, discuss them with a dedicated community, and challenge art historical paradigms with new perspectives and unexpected connections.

## Author Biographies

Darija Šimunović is a cultural studies scholar (MA) and has been responsible for the video art collection and its distribution at the IMAI since 2010. She was a research associate at the Institute for Visual Media of the ZKM Karlsruhe and worked as a visiting lecturer in video art history at the Düsseldorf University of Applied Sciences and the Paderborn University.

Linnea Semmerling is director of the Düsseldorf Inter Media Art Institute (IMAI). She has developed programs and exhibitions for various museums including ZKM Karlsruhe, IKOB Eupen, Marta Herford and TENT Rotterdam. She holds degrees in Cultural Studies, Art Studies and Technology Studies from Maastricht University and the University of Amsterdam.

# Participatory Preservation: Experiments in Distributed Networks of Care

**Kelani Nichole**

TRANSFER Gallery, The Current Museum

Miami, USA

kelaniatwork@gmail.com

## Abstract

The recent emergence of decentralized economies has foregrounded an urgent need for new modes of long-view care and stewardship in contemporary Time-based Media Art. This lightning talk presents some learnings and insights from 10 years of hands-on applied research in the gallery and museum context. Case studies are structured around design thinking methodologies, and outcomes from experiments ranging from new exhibition formats, to collecting models, decentralized storage experiments and more

## Keywords

Conservation, Time-based Media Art Collecting, Immersive Exhibition, Simulation, Virtual Worlds, Decentralized Storage, Museum Operations, Cultural Infrastructure, Peer-to-peer

## Introduction

‘Participatory Preservation’ is a concept that seeks to acknowledge the networks of care and stewardship that surround and support archival efforts. Time-based Media Art is a format that uniquely requires a ‘performance’ in order to experience the work – whether playing a video, interacting with a virtual environment or simply loading a digital image. This is the general sense in which participation will be explored in this lightning talk.

Starting in the context of the gallery as the site of initiation for many Time-based Media artworks, we will look quickly at three efforts piloted in the space of an experimental gallery 1. An approach to exhibiting immersive Time-based Media Art that creates peer context around emerging art to archive a survey of practices 2. A community-focused gallery program that create a connected provenance around a program 3. A blockchain-based solidarity economy infrastructure for exhibiting and preserving complex Time-based Media artworks and redistributing wealth.

Moving next into the space of the institution and museum, we will explore a case study that focuses on a new type of cultural infrastructure that inverts many of the traditional structures associated with institutional longevity, while simultaneously uplifting and furthering the values of rigorous GLAM archival practices.

## The Gallery

As the originating node in the provenance of artworks, a gallery plays an important role in the longevity of Time-based Media Art. When considered as a critical part of the program, a gallery is well positioned to experiment with new forms of contracts, documentation, presentation, display and

other concerns crucial to the archival integrity of an artwork. This is especially salient in the case of Time-based Media Artworks as these works often just consist of licensed rights to collectors and archives, along with the acceptable variations of display and conditions for care and maintenance.

The three examples in this section of the lightning talk referenced in the introduction were facilitated by TRANSFER an experimental gallery focusing on net art and simulation in contemporary art spanning the years 2013–2021. Two of the dominant topics touched upon across these examples are how standardizing display can create both positive outcomes and limitations for the longevity of diverse formats of Time-based Media Art, and how peer-coordinated exhibitions create lasting context for artworks and artist studio practice that is both resilient and precarious.

## The Gallery

The Current Museum tested an experimental model for the patronage and stewardship of Time-based Media Art with the aim of reforming power structures inherent to contemporary art collecting, and expanding access and appreciation and archiving of art to a new generation of collectors. This model was tested in three acquisition salons installed in a SoHo loft in 2018, and resulted in a collection of 15 complex variable media artworks safely maintained in a preservation-grade decentralized storage network.

In this portion of the lightning talk the pillars of this model will be explained, to illustrate how ‘Participatory Preservation’ might perform meaningfully at a local level, while at the same time connecting ‘nodes’ of stewardship globally as an alternative to a centralized archival approach of contemporary art institutions.

## Author Biography

Kelani Nichole is a technologist, collector and founder of TRANSFER, an experimental gallery focused on simulation in contemporary art since 2013. In addition to founding and running a leading digital art gallery, Kelani has spent 15 years in UX research and product development. In 2018 she invented a new model for distributed cultural infrastructure with The Current, a non-profit museum collection rethinking patronage and access for Time-based Media Art. Her work over the past ten years has focused on expanding an understanding and practical application of conservation and preservation through applied research and experiments with a global community of artists, collectors and institutions.

# Digitized Analog Memories – Methods of Visualizing Found Media

Erik Contreras

University of California, Davis  
Davis, California, United States  
ehcontreras@ucdavis.edu

## Abstract

With the rise of home computers in the 1980s and the world wide web being publicly available in the 1990s there has been a boom of media that was created by the public. As these files are getting to be over 30 years old, there is a unique opportunity, as an archivist, regarding curating these files and providing a perspective of this time period for future generations.

“Digitized Analog Memories” is a case study of possible methods for curating personal media found on discarded floppy disks. The method for the study was to create a “desktop vignette”, or digital collage, of the previous owner’s life using legacy hardware and software (Pentium III Windows 98 PC). During the collage process, specific desktop color schemes were chosen based on the content found on the floppy disk as a means of recreating the previous owner’s desktop when they originally created the files.

From this study, three key nodes of discourse around the topic of archiving and presenting historical personal data came up: 1) Is all personal data relevant to archive for historic or anthropological reference? 2) How much subjective flexibility can be given to the curator/artist when it comes to presenting historical digital media? 3) How should the hardware for reading dead formats be maintained for future archival use? From this study, all personal data was relevant, however personal photos and journal entries were the most popular to exhibition viewers. The curation of this material should be minimal and maintain period-correct aesthetics. The media should be raw, but personal information of the original owners should be redacted. While legacy hardware is still cheap and easily available today, institutions need to make the effort to maintain legacy machines for use in the distant future.

## Keywords

Digital Curation, New Media, Found Media, Human-Technology Relations, Media Convergence, Digital Archive

## Overview

This talk will go over the initial discovery of found digital media on obsolete formats, followed by the methods of salvaging media using legacy hardware and curating pieces for public viewing. The initial exhibition of this work was

hosted by the Basement Gallery at the University of California, Davis. During the curation process, balancing the emphasis between the technology used, the digital media files, and the original creator was key. The goal for this work was to humanize the past i.e., finding the analog memories in a digital space.



Figure 1: An example of a “desktop vignette” using media files found on the “Kodak Image” floppy disk from 1997

## Author Biography

Erik Contreras is an interdisciplinary designer and engineer from the San Francisco Bay Area with a background in rapid prototyping, and hardware hacking + repair. His work involves finding alternative uses for post-consumer products and media through hands-on craft and new media digital art pieces. He feels that obsolescence creates an opportunity to showcase a product’s true character in the real world given the influence from consumer culture and technological hype has faded away due to time.

# Screen Recordings and Reinterpretations from Archiving to Creation

## VISIONS.OF.MOUCHETTE.ORG

**Martine Neddham**

Independent Artist  
Netherlands  
martine@neddam.info

### Abstract

Mouchette is an iconic virtual character from the early net.art time. Fourteen screen recordings of her website have been found online on Youtube channels. These videos are documenting the viewing practices of some visitors, the way they browse the website mouchette.org the way they comment their visit, and how they embed it inside their own narrative, stories of horror, of magic or of seduction. These recordings are an exceptional archival of this website recorded by the viewers in very different ways.

### Introduction

For a website like mouchette.org triggering interaction and participative experience, screen recordings are a frequent practice. They are used for archival, due to the fast changing online environment, and they are used in art exhibition since museums and galleries rely mostly on frontal viewing and wall hanging. Screen recordings as I know them are simply functional, a usual way of archival.

But what if a trove of screen recordings of Mouchette.org, full of creativity and imagination is found on Youtube channels, videos made by young people browsing and recording this website to express their personality and feelings, hoping to gather interest, sensation, and a spectatorship of their own? When the public extends the narratives to their own fancy, rather than archival, we are reaching towards collaborative creation or fanfiction. This is what happened when Nikos Voyiatzis found all these videos recordings of Russian kids visiting mouchette.org and telling stories about it. For me, the author of Mouchette.org, the participative aspect of the website is the core of my creation since the very early net.art period when interactive narratives were created with users' participations kept inside huge databases, kept and maintained to this day, and reworked into new creations. So what a wonderful gift it is to fall upon a new generation of internet users who have invented their own practices to represent and share their reactions to my website!

Among these recordings you can meet:

- -Victoria in the 'Viktory Show' channel on Youtube who plays a cute teenager girl, a 'Mouchette-like' ersonality, pretending to discover the website with surprise and bewilderment.
- -Nikitos and Romanos, too young brothers presenting 'Fears Show', episodes of the scary and supernatural stories that stage and enact physically in their own room and where they digitally insert as screams, animations, gifs and other disturbing elements of their own making inside the website of Mouchette.org.
- -You can also meet some very young kids who have difficulty in typing the URL of mouchette.org on the Russian keyboard of their phone and still manage to record their screen and post it to a Youtube channel, with their own comments and mumblings and a tiny thumbnail of their face in the top of their video.

Within mouchette.org, these are all valid collaborative creations, worthy of finding a place inside my website. In the same way that viewers reactions were and still are, kept and reworked into new pieces, a space inside mouchette.org has been devoted to these visions of mouchette.org, to host these films and give full access to viewers through english subtitles from the comments in Russian. I created a subdomain on the website mouchette.org, where I host all the videos

<https://visions.of.mouchette.org/>

First, together with Nikos Yoyiatzis who originally found them, I archived these videos on my archival website, with original technical data and all the comments:

<http://about.mouchette.org/category/archiving/by-nikos/>

And then I proposed them as online exhibitions in their full right. Here it was exhibited insi The Wrong Biennale.

[https://artsubstitute.net/index\\_en.html](https://artsubstitute.net/index_en.html)

<https://artsubstitute.net/neddham.html>

My next step will be to show these works in the physical space in exhibitions as a part of the creation of mouchette.org.

# Research-based Online Archive and the Canonization of Net Art

Tereza Havlíková

Zentrum für Netzkunst  
Berlin, Germany  
tereza@netzkunst.berlin

## Abstract

During the project “Calculating Control: (Net)art and Cybernetics” the Zentrum für Netzkunst had designed and built a small online archive, that includes different resources and references related to the topics of cybernetics, GDR, as well as artworks and specifically net art.

Rather than being focused on a singular medium or an art period this research-based archive introduces one possible narrative, connecting net art to local history and supporting its circulation in the collective online memory.

## Keywords

research-based archives, online archives, alternative archive structure, collective memory, local histories, net art

## Research-based online archive and the canonization of net art

Zentrum für Netzkunst (center for net art) is a small, young initiative reconstructing, maintaining, and preserving net art and net culture. Through their activities, the group researches the possibilities of contextualization of net and digital art. [1] Since 2019 Zentrum für Netzkunst has been a pioneer user in the House of Statistics in Berlin – an urban project aiming to bring together social, artistic, and activist initiatives. [2]

The location of Haus der Statistik was a point of departure for the exhibition and research project “Calculating Control: (Net)art and Cybernetics”. [3] Working from the site-specific history of Haus der Statistik (a building that operated as the Central Administrative Headquarters for Statistics in the German Democratic Republic), the project explored the impact of cybernetics on artistic and social practices, networks, and technology. As part of the project Zentrum für Netzkunst designed and built a small online archive that is still accessible and updatable to this day. It includes different resources and references related to the topics of cybernetics, GDR, as well as artworks and specifically net art. The archive was built by “misusing” the open-source software for bibliographies Zotero. The research assistant program works as the input mask for entries as well as a control panel for the archive. This structure allows making new links between net art and other historical artifacts and references.

The “Calculating control” archive is not directly preserving the material, the books, or the artworks related to the project, but it works as a growing collection of

references. It is archiving the process of the research as well as the parts of the project, stretching the definition of an archive to its limits.

Even though it might seem that such an archive doesn’t fulfill its function as an agency for the long-term preservation of net art, it is not an “empty” archive. It has a specific value and function in the canonization of net art. Rather than being focused on a singular medium or an art period this research-based archive introduces one possible narrative in which specific net art works can be anchored. It connects net art to local history, as well as to a discourse outside of the art historical field.

For an art practice such as net art, the process of canonization has been a difficult and slow journey. Because of the nature of net art that is spread on the internet, often located on a unique domain, the usual tools for a centralized archive are not available. One example of an attempt to establish a net art canon is the Net Art Anthology by Rhizome but as the name hints, it also doesn’t identify as an archive but also operates as a collection of references. [4]

For net art, one possible way to establish an archive or a canon is by continuous reproduction and connection to different narratives and contexts. Projects like the “Calculating Control” Archive support the circulation of net art in the collective online memory, connecting it to different narratives and discourses and stabilizing its position in the still-emerging canon.

## References

- [1] Zentrum für Netzkunst website, accessed January 27, 2022, <https://netzkunst.berlin/>
- [2] Haus der Statistik website, accessed January 27, 2022, <https://hausderstatistik.org/>
- [3] Archive of the project “Calculating Control: (Net)art and Cybernetics”, accessed January 27, 2022, <https://netzkunst.berlin/cc>
- [4] Net Art Anthology, accessed January 27, 2022, <https://anthology.rhizome.org/>

## Author Biography

Tereza Havlíková (born in Prague) is an art historian and curator living in Berlin. Her research focuses on net art and digital art in a broader context of internet history and culture as well as online curatorial practice. She is a founding member of Zentrum für Netzkunst and a pioneer participant in the urban model project Haus der Statistik in Berlin.

# UNCOPIED.ART

## Making the original truly unique: Introducing a blockchain for GLAM institutions

Eveline Wandl-Vogt<sup>1,2,3,4</sup>, Elian Carsenat<sup>1,5</sup>, Dario Rodighiero<sup>1,4</sup>

1 UNCOPIED.ART; 2 Ars Electronica Research Institute knowledge for humanity;  
3 exploration space (at) Austrian Academy of Sciences; 4 metaLAB (at) Harvard; 5 NamSor  
Paris France; Linz, Vienna Austria; Cambridge USA  
[elian.carsenat@namsor.com](mailto:elian.carsenat@namsor.com), [eveline.wandl-vogt@oeaw.ac.at](mailto:eveline.wandl-vogt@oeaw.ac.at), [dario@metabolab.harvard.edu](mailto:dario@metabolab.harvard.edu)

### Abstract

This lightning briefly introduces the conceptual aspects of uncopied.art, an endeavour with the mission to make ORIGINAL truly UNIQUE, with physical and digitally immutable certificates of authenticity, expertise, inventory that will outlive us. In the tal the authors discuss the core values, offering a closer view to the workflow of certification. The authors focus on the opportunities, UNCOPIED may offer for archiving and aim to jointly discover potential risks and pitfalls going along with implementing this emerging technology for the long run in archives. Furthermore, the audience will be introduced to the recent case study that relies on a collaboration with LCMA, the Los Angeles County Museum of Art.

As a byproduct of securing art works on a transparent blockchain, UNCOPIED makes available its own dataset to scientists interested to work with open data for research purpose. UNCOPIED aims to provide innovative methods to secure digital collections by making metadata public. A scientific committee is in charge of making the dataset accessible in the respect of stakeholders interests, privacy and ethical concerns. The authors briefly discuss the current non-hierarchical organizational setting of UINCOPIED and outline it's necessity against the background of Open Innovation and it's meaning in the progress of innovation.

### Keywords

Unique Art, Blockchain, NFT, Emerging Technologies, New Technologies for Archiving, New Directions in Archiving, Sustainability, Certification, Ethical Concerns, Open Innovation

### Introduction

Blockchain technologies become more dominant in the art market and in data systems and protocols.

The mission of UNCOPIED is providing certificates to guarantee original artifacts a longer life. UNCOPIED was founded in 2020, with the aim to make originals truly unique, with physical and digitally immutable certificates of authenticity, expertise, inventory that can outlive us. The objective was to find a solution to distribute the digital

image freely as Creative Commons, yet make limited edition physical prints which could be proved to be limited. So the idea gradually became a mission statement : creating an open source solution to certify the authenticity of both physical and digital objects, combining the physical chirograph with QR code, blockchain, IPFS and a reverse search engine.

Uncopied is an open source solution built on other open source solutions or industry standards. The service shall include a 10-year 'promise' for digital conservation and technical suitability. Algorand blockchain technology is an important part of our architecture. Algorand solves the blockchain trilemma (security, scalability, and decentralization) without any compromise and it can not fork, which is an important feature for a NFT platform. At this point, we see IPFS and GitHub as our key technology for long term storage. We collaborate actively with AIS (the Art ID standard consortium) which aims to create shared ownership of the artwork identifiers, by leveraging the new W3C standards for decentralized identifiers (DIDs) and self-sovereign identity. Applied to the art market, it allows the different actors and stakeholders to make verifiable claims about an artwork about its provenance and authenticity.

Regarding metadata, we follow the work done by schema.org for linked open data. We also keep close watch on linked.art, as an emerging metadata standard to describe cultural heritage.

Engaging a wide community of stakeholders can be complex and we refer to risks, inherent to a field of innovation which challenges countries and traditional legal systems with its motto 'the code is the law'.

The UNCOPIED tokens represent an immutable proof of provenance for a physical or digital object. As such, they are non-tradable and inalienable. But the token can be moved to a different UNCOPIED wallet to represent the artwork's status, for example, to document a case of legitimate censorship.

Another bold choice we made is to tie the UNCOPIED certificate not just with metadata, but also with a plain-

english document. It allows for natural language to express what cannot yet be expressed as ‘metadata’ or ‘code’ : the spirit of the law that will govern the smart contract.

This innovative model can be used to break silos across multiple blockchains, as long as there is a bijective one-to-one relation between the certificate token and the value token (the NFT).

The core values of UNCOPIED are: Open, Durable, Inalienable, Sustainable, Inclusive, Unobtrusive and Simple.

This lightning briefly introduces the conceptual aspects of uncopied.art and it’s core values, offering a closer view to the workflow of certification. The authors focus on the opportunities, UNCOPIED may offer for archiving and aim to jointly discover potential risks and pitfalls.

Furthermore, the audience will be introduced to the recent case study that relies on a collaboration with LCMA, the Los Angeles County Museum of Art.

As a byproduct of securing art works on a transparent blockchain, UNCOPIED makes available its own dataset to scientists interested to work with open data for research purpose. UNCOPIED aims to provide innovative methods to secure digital collections by making metadata public. A scientific committee is in charge of making the dataset accessible in the respect of stakeholders interests, privacy and ethical concerns.

### **Authors Biographies**

Dario Rodighiero works at Harvard University. He is affiliated at the Berkman Klein Center for Internet & Society and a postdoc of

the Metalab. His capacity at the intersection of visual studies, data science, and digital humanities makes him comfortable in multiple disciplines. With Metis Press, he published in 2021 Mapping Affinities.

Elian Carsenat is a computer scientist trained at ENSIIE/INRIA, started his career at JP Morgan in Paris in 1997. He later worked as consultant and managed business & IT projects in London, Paris, Moscow and Shanghai. In 2012, Elian created NamSor, a piece of sociolinguistics software to mine the 'Big Data' and better understand international flows of money, ideas and people. NamSor helps answer the perennial question all countries ask about their diasporas – who are they, where are they and what are they doing. In 2020, NamSor is building new APIs to estimate risk for gender, racial or ethnic biases in applying machine learning or other artificial intelligence to decision making that affects People's lives.

Elian is founder and CEO of uncopied.art.

Eveline Wandl-Vogt is a thinker and maker, knowledge designer, creative experimentalist and innovator. Against a background of Art Driven Innovation, Humanity Centered Design and Open Innovation, she is facilitating Social Innovation for the purpose of good, contributing to invent inclusive, sustainable. responsible futures.

Eveline is foundress and orchestra of exploration space (at) ÖAW and foundress and Director of Ars Electronica Research Institute “knowledge for humanity”. She is affiliated to metaLab (at) Harvard, and is ambassador for “knowledge for humanity” of the Republic of Uzupis.

Eveline is chair of the scientific committee of uncopied.art.

# Introducing Videotage Media Art Collection (VMAC)

**John Chow, Wing Shan Chung**

Affiliation (s): VIDEOTAGE

Location, Country: Hong Kong, China

Contact Emails: [johnchow@videotage.org.hk](mailto:johnchow@videotage.org.hk), [shanchung@videotage.org.hk](mailto:shanchung@videotage.org.hk)

## Abstract

Founded in 1986, [Videotage](#) is a leading Hong Kong-based non-profit organization specializing in the promotion, presentation, creation and preservation of new media art across all languages, shapes and forms. Videotage Media Art Collection (VMAC) strives as the identity and body that documents Hong Kong's extensive media art history. Through Hong Kong's character of a cultural, geographical and political peninsula that uniquely merges Chinese and Western influences, the collection depicts how the city has been a sensitive witness to a period of art in history. It also displays the development of society as much as that of technology-exploring issues of identity and life in urban, political and cultural environments through a wide array of techniques that mark the transition from analogue to digital artmaking.

## Keywords

Video-art, VHS, Digitalization, Art-communities, Collaborative preservation, Hong Kong

## Documenting Hong Kong Early Media Art's Communities

VMAC is a unique witness to the development of Hong Kong video media culture in the past three decades. Preserving over 2000 magnetic tapes/born-digital video artworks and 1500 programme documents from the early media art scene. The collection features an extensive scope into local pioneer video artists with manifold backgrounds, covering a great diversity of genres from personal video diaries and letters, workshop result, found-footage remixes, theatre performance, cell animation to feature-length mockumentaries. Notable collections include Ellen PAU, WONG Chifai, May FUNG, Danny YUNG (ZUNI) and HUNG Keung.

We share the gradual challenge in pursuit of preserving artistic authenticity of obsolescing media art objects. With this opportunity, we would like to share our storage practice towards magnetic tapes and obsolescing machines

(such as reel projectors and CRT TVs), and our house digitalization method on tapes and printed materials.

With the objective to build a brand new platform for research, education, curatorial practice, and artistic production, Videotage strives to provide curators, artists, students and scholars resources at VMAC to support project facilitation, realization, concept synthesis, presentation, documentation, and networking. Currently, VMAC is developing an online-streaming platform with semantic taggings in hope of a more effective information retrieval experience to the local research community needs.

Recent notable projects include: "[Why An Archive](#)" (curated by Ariane Beyn), as part of Times Art Center Berlin's exhibition *Readings From Below* in collaboration with Arsenal - Institut für Film und Videokunst e.V.; "[Discourse of Reimagined Hong Kong Art Communities](#)" archival series (curated by Lo Yin-shan), as part of [New Horizons: Ways of Seeing Hong Kong Art in the 80s and 90s](#) exhibition in collaboration with the Hong Kong Museum of Art (HKMoA); "[Either Too Quiet or Too Loud](#)" (curated by Hsiao Bochun) with Taipei Contemporary Art Center and Hong-Gah Museum; and "[Hallucinatory Hereafter](#)" (curated by Vennes Cheng Sau-wai) as M+ Mediatheque guest-curated programme.

In pursuit of collaborative preservation across regions, VMAC expanded their collection towards the greater china region from 2019, and have broadened the collection with 98 new entries selected by esteemed guest curators. Notable mentions including TAO Hui, Liang ZHAO, CHEN Shao Xiong from China Collection curated by SU Wei (Independent art critic and curator, Beijing); Wang Jun-jieh, Yuan Goang-ming, Su Hui-yu and Hsu Chia-wei from Taiwan Collection curated by Song-Yong SING (Institute of Interdisciplinary Art, TNUA).

# Archiving Twitter Database & Visualization from Artwork

Jiayi Young

University of California, Davis  
Davis, USA  
jdyoung@ucdavis.edu

## Abstract

In 2020, I created an artwork on the state of truth-telling crisis during the 2020 U.S. Presidential Election. The project is titled *Project Echo*. [1] It is a multi-modality and multi-disciplinary new media artwork involving Twitter data and took two and a half years of extensive research collaboration with a political scientist and a computer engineer to develop. When the project concluded shortly after the Capitol insurrection, we realized that we had compiled a significant database of Tweets. It has become a valuable historical record of Twitter disinformation activity relating to the 2020 U.S. Presidential Election. As an artist unfamiliar with how archives are established, I am interested in figuring out how to provide public access to the database and its associated visualizations. I look to cultural institutions to help establish an archive of the database and provide the public with the opportunity to access this piece of American History.

## Keywords

archiving strategies, database, Twitter data repository, 2020 election disinformation, social media, astroturfing, truth-telling, historical artifact, public access, American history

## The Artwork

*Project Echo* [1] is a multi-modality and multi-disciplinary new media artwork on the state of the truth-telling crisis during the 2020 U.S. Presidential Election. Through two and a half years of extensive research collaboration with a political scientist and a computer engineer, situated in an expanded field of new media art, the artwork — functioning as an apparatus — provided legibility into the black box of astroturfing efforts on Twitter; at the same time, enacted a platform for voices of protest and expressions of lived experiences in a post-truth society.

The project took place in the critical eight-months-period preceding the 2020 election. It consisted of two components that worked in tandem: an online disinformation tracking and visualization interface and a temporary public art social intervention that took to billboards, bus shelters, and grocery stores in critical swing states. Specially developed for the project, the team created a process to curate disinformation, combine the query of historical and real-time Twitter data, set up a backend database, and materialized real-time frontend visualization of disinformation spread.

## The Database

The database consists of 204 disinformation topics from April 28, 2020, to February 20, 2021, 2,623,792 Tweets, 1,030,066 users, and 2,365,660 incidences of user interactions. There are 103,879 accounts found displaying a high probability of being fully automated social bots carrying out astroturfing efforts designed to deceive and create the appearance of a grassroots movement. Ninety percent of the dataset retained the full original data fidelity of the Twitter landscape at the time. We captured these Tweets before Twitter performed mass deletion of major disinformation spreaders in January 2021 after the Capitol insurrection. The record contains the now-deleted @realdonaldtrump and 70,000 QAnon accounts.

This information is currently stored in a database and maintained on Amazon AWS. The following diagram (Figure 1) illustrates the structure of the database. The visualization is currently running using AWS Lightsail.

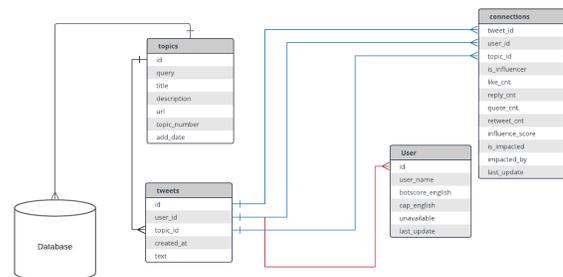


Figure 1. Project Echo Database Diagram. ©Jiayi Young Studio.

## References

[1] Jiayi Young, et al. “Project Echo: Thoughts in Fleeting Moments”, University of California, Davis, website, accessed March 29, 2022, <https://project-echo.ucdavis.edu/>

## Author Biography

**Jiayi Young** is an artist and a designer. She is an Associate Professor of Design at the University of California, Davis.

# The Different Histories of Electronic Art in the V2\_ Archive

**Arie Altena and Michel van Dartel**

V2\_ Lab for the Unstable Media  
Rotterdam, The Netherlands  
arie@v2.nl, michel@v2.nl

## Abstract

V2\_ Lab for the Unstable Media is an interdisciplinary center for art and media technology in Rotterdam, the Netherlands. It strives to build a ‘living archive’ of electronic art, using its own documentation from over 40 years, made accessible on its website. This presentation outlines some of the strategies to bring out the *different* histories of electronic art that narrate the art form’s critical role in giving meaning to and (re-)interpreting the real-world effects of technology.

## Keywords

Living Archive; Electronic Art; Art History; Dissemination.

## Introduction

V2\_ Lab for the Unstable Media is an interdisciplinary center for art and media technology in Rotterdam (the Netherlands). Founded in 1981, V2\_ creates a context in which issues regarding the social impact of technology are explored through critical dialogue, artistic reflection and practice-oriented research. The V2\_Archive contains descriptions of more than 1,300 events organized by V2\_ over the past 40 years, along with about 600 longer accompanying texts (essays, lectures), descriptions of almost 1,000 works of art and other projects exhibited at V2\_, and more than 1,600 biographies of artists and speakers. There are also links to hundreds of videos, ranging from full recordings of events to brief interviews with artists; hundreds of scanned program booklets and PDFs; and thousands of photographs. Through its integration in V2\_’s website, the archive continues to grow daily with every activity V2\_ undertakes. Besides offering a valuable publicly accessible resource for researchers investigating the evolution of the field of art and technology, V2\_ strives to activate its archive in order to make this evolution of value for contemporary culture, current art production, and the public.

No unequivocal picture can emerge from an archive like this one. Its diversity and size make that all but impossible. An archive invites research, browsing and discovering connections. We work from the assumption that V2\_ archive does not yet represent a history: it possesses the potential for history to be written. V2\_ strives for a ‘living archive’, where the documentation that is offered is used to create different stories about the past, that might give insight into the now and the future – especially with regard to the effects that technology has on the arts and on society.

The strategies V2\_ currently undertakes to realize the potential of the archive include archival research into the curatorial processes centered around our presentations and productions. This research is also published and/or presented at events. The recent publication *40 Years of V2\_*, as well as the establishing of a list of 40 iconic works, chosen by the public, are part of this. One particular example is this is taking key works from the history of electronic art as a starting point for contemporary artistic research in the program *Re-enacting the V2\_Archive*. An unlikely success is the featuring of archival research in the monthly V2\_radio programme on Operator Radio. The undertakings can be seen as strategies towards achieving a living archive, and a lively discourse on the history of electronic art.

These strategies to argue that their pluriformity is paramount to bring out the different histories of electronic art. This emphasize on the different stories through which the history of electronic art can be told is a critical reminder that archives such as V2\_’s are important to challenge the singular innovation-oriented narrative that currently dominates the historical analysis of electronic art. V2\_’s archive is an asset in the narration of electronic art’s critical role in giving meaning to and the (re-)interpretation of the real-world effects of technology, but it needs to be used to make those different histories come alive.

## Acknowledgements

This presentation is made possible with support from Stimuleringsfonds Creatieve Industrie, Gemeente Rotterdam, and Netwerk Archieven Design & Digitale Cultuur.

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## Author Biographies

*Arie Altena* is archive editor at V2\_ and the author of *Wat is community art?* (2016) and *40 Years of V2\_* (2022).

*Michel van Dartel* is Director of V2\_Lab for the Unstable Media and Research Professor at the AVANS Centre of Applied Research for Art, Design and Technology (CARADT).

# MEMODUCT posthuman.archive: The Site-specific Media Art History

Violeta Vojvodić Balaž and Eduard Balaž

<https://memoduct.org>

Belgrade, Serbia

violeta.artstudio@gmail.com

## Abstract

MEMODUCT *posthuman.archive* is a repository of media art practices in the field of digital humanities, site-specific media art history and cyber-anthropology. The major contributions of the project are: 1) Archiving of media art from the underrepresented regions, i.e., *The Global Margin*, initiatives that were recent and as such exhibited at the most important exhibitions and festivals, but which have not yet been explored in depth and systematically processed as a cluster, or a scene; 2) Documentation of the new media artworks that became “inaccessible” due to the instability of the Internet media and the rapid obsolescence of computer technology; 3) Modeling of new methodology in relation to the question: *How to write European history of tactical media and environment art, the conjuncture of New Europe 1988-2022?*

## Keywords

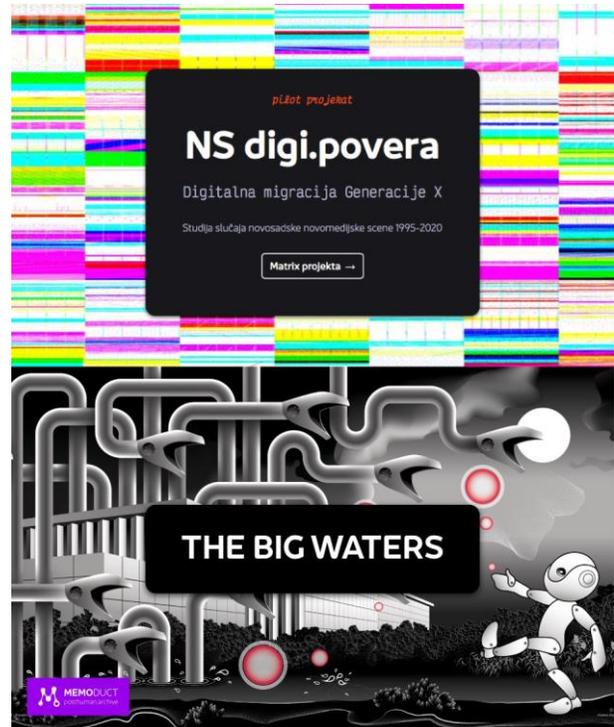
Memex, site-specific media art history, information art, environmental art, tactical media, New Europe

## Introduction

MEMODUCT builds on Vannevar Bush’s concept of the memex—how technology can help to capture marginalized creation/innovation. Its goal is to enable future researchers to study evolution of the environmental complexity and the genesis of site-specific media art phenomena: the employment of tools, the development of iconography, the formation of professional identities and the emergence of personal epistemology of an artist.

The first pilot project was *NS digi.povera*, an ongoing research on media art scene in *Novi Sad* which originated in the war conjuncture on the periphery of New Europe (1988–2022), after the opening of the Internet for citizens, in a hybrid environment shaped by the scarce resources of fundamental economy and virtual economy.

MEMODUCT core topics are: Control, Infowar, Cyber Ecosystem, Construction of the Future.



©Memoduct 1) Site-specific media art history, e.g. *Novi Sad digi.povera*; 2) Artists’ socio-biographies, e.g. *The Big Waters*.

MEMODUCT case studies of artworks were/will be formatted according to categories: 1) *Conjuncture*, state of the social system, its economic, political and other aspects; 2) *Context*, autopoietic system of science, history and theory of art. 3) *Concept*, an idea of artwork and an artist statement; 4) *Iconography*, visualization of ideas and symbolic representation; 5) *Technical description* of the setting and technologies used. Biography of the artists are/will be made in a form of socio-biography since an artist performs as a witness of the paradigm change, i.e., technological, environmental and social transformation.

# 2<sup>nd</sup> Summit on New Media Art Archiving ISEA2022

## Collecting and Preserving Expanded & Extended Nonfiction

**Arnau Gifreu-Castells**

ERAM – University of Girona  
Girona, Spain  
arnau.gifreu@eram.cat

### Abstract

The history of the evolving field of new media work is pushing individuals to take a huge effort to preserve important artifacts and analyse projects. *Extended Nonfiction* is a project that promotes the study, training, production and preservation of audiovisual, interactive, transmedia and immersive nonfiction narratives. *Extended Nonfiction* is an informative, formative and productive proposal that places emphasis on the field of reality, on real stories; but not just any reality, on expanded and extended reality.

### Keywords

Online Preservation, Works collection & Analysis, Database, Non-fiction Narratives; Reality; Audiovisual Narrative; Interactive Narrative; Transmedia Narrative; Immersive Narrative.

### Description

The first phase of the project includes the creation of a platform in the form of an observatory that includes and preserves different genres and formats of extended reality. These genres include documentary, journalism, education, museums, essay, political discourse and reality TV, among many others. All these nonfiction genres and formats are mixed with different narrative expression forms, such as audiovisual, interactive, transmedia and immersive. The second phase is the design and implementation of a training academy-school. The third phase includes the stimulation and transfer of knowledge for production, through consulting with companies and brands to generate real storytelling that becomes specific branding. Here we present the results of the first phase of the project, and specifically regarding the platform we are developing in order to preserve works, templates and guidelines for interested audience such as producers, students, companies, etc. The

current proposal is based on the creation of a web platform structured as a database containing and analyzing in detail the production process of 50 interactive, transmedia and immersive non-fiction projects in which we have worked in different roles during our professional career. These projects can be consulted from the delimitation of a set of filters (time, period, topic, etc.) that allow users to generate templates adapted to their needs providing learning and useful guides for the production of this type of works. The project is currently in an advanced state of development, but draws on extensive research in the field of interactive documentary [1] and production of non-fiction works [2] during the last 15 years.

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### Author Biography

Doctor in Communications and has a Master's Degree in Digital Arts (UPF). He has been a research affiliate at the Open Documentary Lab (MIT, 2013-2018) and part of the i-Docs group (University of the West of England). He has published various books and articles in his research area, interactive, transmedia and immersive non-fiction, and specifically on interactive documentaries.

# **-Panels-**

# Multi-Generation Digital Stewardship: XR Art & Technology Archives

## Moderator: Rhonda Holberton

Assistant Professor of Digital Media Arts, Department of Art & Art History San José State University

## Panelists

Don Hanson, Founder of New Art City (USA)

Amanda Helton, Manager of Digital Strategy, San José Museum of Art (USA)

Dr. Timothy C. Summers, Board Member of the enterprise think tank Leonardo/ISAST (USA)

Nick Szydowski is the Scholarly Communications & Digital Scholarship Librarian at San José State University (USA)

Location: San José California, USA

Contact Email: [rhonda.holberton@sjsu.edu](mailto:rhonda.holberton@sjsu.edu)

## Abstract

Panelists will discuss their roles in a collaborative inter-institutional project funded by the Knight Foundation to create an XR & blockchain certificate enabled digital database that will archive, index, lend, and exhibit complex digital objects using a web-based platform that expands the current capabilities of the virtual 3D exhibition platform New Art City.

The panel will offer perspectives on collections management, blockchain certificates, artist contracts, and best practices for reauthoring. The team will provide insights from the first 6 months of the beta test of this collaborative project which archives and exhibits Creative New Media Projects produced in San José from 1984-2014 on New Art City. The Art & Technology Archive beta test will allow the technical and digital design upgrades to follow the material, social, and archival process; ensuring that necessary upgrades to New Art City are designed holistically and inclusively with integrated feedback from Museums, Librarians, Archivists, & Curators.

## Keywords

Digital Archives, XR Archives, Blockchain Certificates, NFTs, Controlled Digital Lending, Cross-Platform Compatibility, Digital Stewardship, XR Accessibility, Publicly Accountable Cross-Sector Partner Service Organizations, Durable Code

## Introduction

Rhonda Holberton, Assistant Professor of Digital Media Art, San José State University (SJSU), is leading an initiative with the panelists to preserve and archive several important bodies of digital media produced within the Silicon Valley in 1984-2014. The archive will focus on complex digital objects (with special attention to XR and 3D files), and collaborative research from the CADRE Media Lab at San José State University, SWITCH Journal, Leonardo/ISAST, ZERO1, and the San José Museum of Art archive/collections.

The entries will be archived on New Art City, a virtual exhibition toolkit originally developed by Don Hanson (once an MFA candidate in the CADRE program at SJSU) in response to the loss of physical exhibition opportunities for our community. New Art City utilizes web stable languages (HTML, JS, & CSS) which will ensure the longevity and accessibility of new media works that were originally produced to run on esoteric or out of date platforms. Students currently enrolled in the Digital Media Art program at San José State University will work directly with the original artists & digital creators to identify processes for rebuilding original artworks and/or archiving components for future researchers.

User experience of the archive will be grounded in interactive engagement with the region's rich history of collaborative new media art production utilizing an archive built on the New Art City web-based 3D platform. Unlike traditional digital archives, the SJSU XR Archive will integrate collection management databases, blockchain security certificates, digital lending, and exhibition

services. Users of the lending and exhibition services will experience spatial proximity, temporal texture, and architectural aggregation rather than overlapping windows or the long scroll to help researchers, exhibition designers, and public visitors make deep connections to and between digital entries.

Dr. Darra Hofman's research focuses on the intersection of archives, technology, and law. Her research and teaching interests are in investigating the impact of emerging technologies such as blockchain technology and artificial intelligence on archiving practices. She will oversee database integration metadata and hashing systems for blockchain certification of provenance and integrated fair use contracts. The interface will be set up to provide multilayered accessibility, and community facing features that will log specific dynamic feedback through the exchange of personal, regional, and associate knowledge tied to a sharable digital entry that accumulates new user contributions every time it is curated into an exhibition.

**Digital Stewardship** As envisioned, the archive is the first of 3 discrete phases of development that fit into a longer-term vision; the instantiation of the Center for Creative Digital Production & Stewardship at SJSU. Within the center, Faculty and Students will collaborate with digital creators and partner institutions to develop best practices and documentation for digital stewardship of technology-centered artist practices and create standards for artist contracts for institutional acquisition of digital work using blockchain technology applied in concert with controlled digital lending via the Martin Luther King Library.

Digital stewardship brings together the concepts of both digital preservation and digital curation and provides a framework for long-term thinking to ensure that preserving and managing digital content for the long-term is not merely an afterthought, but baked into the production process.

### New Art City (NAC) Platform

Originally developed as an online exhibition solution for Digital Media Art BFA exhibition at SJSU, the New Art City platform has since expanded to host international art exhibitions with institutions like Gray Area SF, Bitforms Gallery NYC, Lumen Prize, Format Festival and several solo and group shows for individual artists & digital creators. The platform will allow designers to spatialize the visitors' experience of media entries in the archive using architectural orientation to present oral histories and contextual information alongside primary resources that take the form of websites, video, 3D animations, image, text, and soon; VR projects.

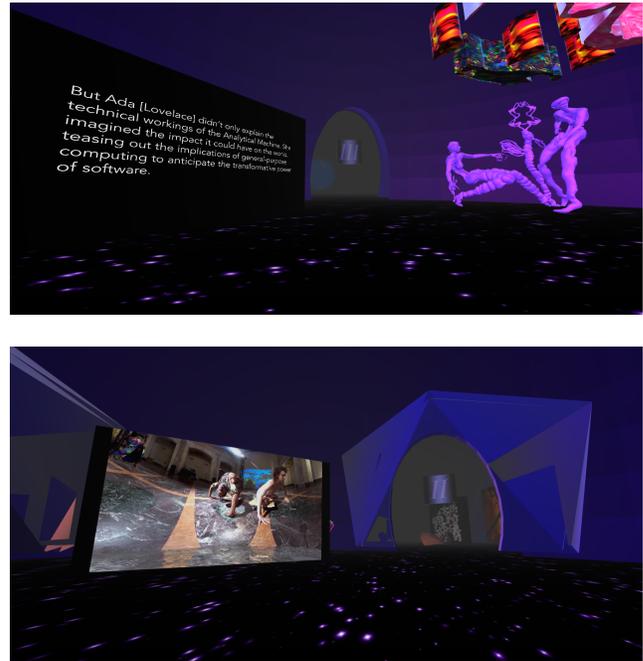


Figure 1. Screenshots of [Unbound Unleashed and Unforgiving Exhibition](#) hosted by New Art City. Works shown (left to right): Caroline Sindere: Femenist Data Set, German Lavroskii: Reborn, Otrus Extraviadus: parallel chaosmosis, Eva Davidova: Global Mode, Jeremy Diamond: Datura ©Artist Retain Copyright

**NAC & Accessibility** In Fall 2020 Professor Holberton worked with NAC founders to help complete a Voluntary Product Accessibility Template (VPAT) for New Art City. In Spring 2021 the California State University System certified NAC for systemwide use after determining the platform met Federal Accessibility requirements. In addition to the 3D environment, NAC now provides a 2D view optimized for Screen Readers. In their [Accessibility Statement](#), NAC provides standards for accessible 3D environments, and is excited to work with the team to define new standards for accessibility in Mixed Reality environments including sound triggers/guidance, guided tours in 3D & XR environments, and new forms of translation between XR, 3D, and 2D web designs

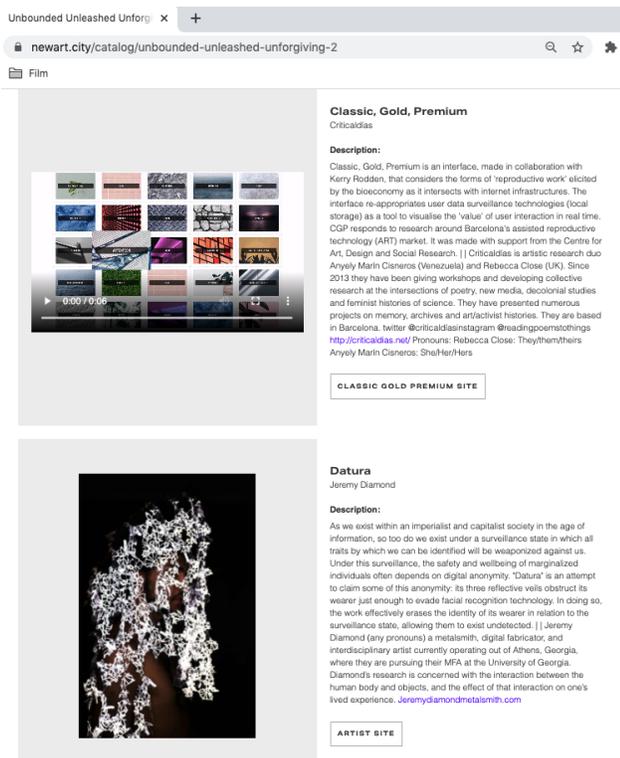


Figure 2. 2D Catalogue View of Unbound Unleashed and Unforgiving Exhibition hosted by New Art City. The catalogue view is automatically generated when exhibition designers upload their digital assets to the platform, alt text can be added for screen readers. ©Artist Retain Copyright

## Audience & Impact

The project leads of the Multi-Generation Digital Stewardship project believe the practice of citation is a political act that shapes the future as much as it contextualizes the past. With this framework in mind, it is important to recognise preservation as a political act as well; and to understand that all archives suffer from intersecting and overlapping biases, limited accessibility, and data rot. San José State University (and public universities more broadly) can play an important role as a publicly accountable cross-sector partner service organization in the production and long-term preservation of tech-centered artist practices. Toward this goal, the Multi-Generation Digital Stewardship project team is currently:

- Working with librarians & archivists to expand the capabilities of research databases that determine what is citable in the first place
- Collaborating with artists & digital creators to create best practices for the digital stewardship of ephemeral technology dependent projects

- Connecting communities from public institutions with students and faculty at San José State University in the production creative projects that make meaningful technological advancements while at the same time expanding public understanding the social impacts of technology
- Providing support to technology platforms to develop accessible standards in-line with Section 508 of the Rehabilitation Act published in the Federal Register to ensure the technology we use in our projects is available to the broadest community possible

## Inter-Institutional and Community Collaborations

Through collaborations between SJSU, SJMA, NAC, Leonardo/ISAST, and ZERO1, the Multi-Generation Digital Stewardship project will build bridges between SJSU students, the San José Public, and contemporary Digital Media Artists & Digital Creators. This is an exceptional opportunity to celebrate the rich legacy of interdisciplinarity at SJSU and our legacy of collaboration with art institutions in the South Bay while at the same time creating standards and best practices for the production & preservation of tech-centered artworks for generations to come.

As one of California State University's Hispanic Serving Institutions (HSI) and Asian American Native American Pacific Islander Serving Institutions (AANAPISI) as recognized by the United States Department of Education, the San José State University community represents a diverse set of perspectives. The Multi-Generation Digital Stewardship project team and organizational partners integrate the student body and communities within the city in the design of the archive and the curation of the entries within it to advance a broad and socially responsible approach to integrating artistic expression within historical contexts.

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## Panel Biographies

[Rhonda Holberton](#), Assistant Professor of Digital Media Arts, Department of Art & Art History San José State University. Holberton's interdisciplinary research and art practice illuminates the politics of the corporeal body navigating through virtual space. Recent projects utilize networked VR designed to trigger subtle interactions of electrons between biological and digital systems through biofeedback & reiki, a speculative cosmetic company whose mission is focused on the potential of products to create distributed performative action ritualizing the Anthropocene, and a collaborative choreography with Neural Networks. [rhonda.holberton@sjsu.edu](mailto:rhonda.holberton@sjsu.edu)

[Don Hanson](#), Founder of New Art City. Don is an interdisciplinary/internet artist producing web-based interactive work and digital artmaking tools since 2008. As founder of New Art City he aims to provide an accessible toolkit to all types of artists and create an online home for born-digital artifacts. As an active member of the arts and technology community in the Bay Area, Don has served as technical director for Codame Art+Tech and B4BEL4B Gallery, and now focuses full-time on the operations and development of New Art City. [don@newart.city](mailto:don@newart.city)

Amanda Helton, Manager of Digital Strategy, a position created as part of the San José Museum of Art's (SJMA) 2018 strategic plan, Helton works closely with the curatorial and public programs teams to develop innovative digital engagement tools that expand access to the Museum's programs and permanent collection. At SJMA since 2017, she served as project database registrar for 50X50: Stories of Visionary Artists from the Collection, a major grant-funded digital publication designed to share the Museum's permanent collection with a wide audience. Subsequent ongoing projects support efforts to shape the technological vision for the Museum's future and to support its strategic ambition to be a borderless museum. Helton is also deeply committed to accessibility issues in both the physical and virtual realms and is a member of the Museum's Equity Task Force. [ahelton@sjmusart.org](mailto:ahelton@sjmusart.org)

[Dr. Timothy C. Summers](#), Board Member of the enterprise think tank Leonardo/ISAST, is a seasoned, high-impact executive with broad strategic perspective and a proven track record in growing businesses, delivering solutions to problems, and developing and executing sound internal processes from the ground up. He is an ethical hacker, professor, frequent media commentator, TED

speaker, and consulted expert internationally recognized as one of the world's leading experts on cyber strategy, blockchain, normal chaos, and how hackers think. He is a trusted adviser and executive consultant to Fortune 500 companies, academic institutions, and governments worldwide. Timothy specializes in the scholarship and practice of hacker cognitive psychology (the hacker's mindset) and normal chaos paradigm enabling him to advise on building and sustaining organizations during times of uncertainty. Dr. Summers is an executive scholar with an in-depth understanding of disruptive technologies and their strategic applications, as well as international business expertise, having conducted business in North America, the UK, Europe, Africa, and Asia. He is a motivated self-starter who has developed a thriving, reputable consulting practice that is considered among the best in the world while maintaining a dedication to community service. [tcsummers@asu.edu](mailto:tcsummers@asu.edu)

Nick Szydowski, Scholarly Communications & Digital Scholarship Librarian, Martin Luther King, Jr. Library, San José State University. Nick is a librarian with experience in scholarly communications, repository management, preservation, and web development. His recent projects include the digital exhibit *Robert Morris: Civil Rights Lawyer & Antislavery Activist*. [nick.szydowski@sjsu.edu](mailto:nick.szydowski@sjsu.edu)

# Demusealizing the museum: audience's digital agency and institutional critique 2.0 as possible futures for art institutions

Nathalia Lavigne, Dr. Prof. Giselle Beiguelman, Dr. Bruno Moreschi, Prof. Rafael Pagatini

School of Architecture and Urbanism of the University of Sao Paulo (FAU-USP)/Humboldt Universität zu Berlin São Paulo, Brazil/  
Berlin, Germany; nlavigne@usp.br; School of Architecture and Urbanism of the University of Sao Paulo (FAU-USP); São Paulo, Brazil;  
gbeiguelman@usp.br School of Architecture and Urbanism of the University of Sao Paulo (FAU-USP); São Paulo, Brazil;  
brunomoreschi@gmail.com Federal University of Espírito Santo, Vitória, Brazil; rafael.pagatini@gmail.com

## Abstract

This panel aims to discuss some artistic and research projects that explore new methodologies of working with digital museum archives and User Generated Content (USG) to 'demusealize' some established institutional practices. In a moment when the role of museums and their very definition are strictly problematized, how Artificial Intelligence (AI) systems and collaborative hashtags on social media can be used to dismantle museum discourses? In which way these digital tools are able to be explored as a new kind of institutional critique? Could these systems also be used as a way to expand poetic layers of art beyond its marketing and productivist focus? From these raised questions, the researcher and curator Nathalia Lavigne will moderate a discussion with the artists and researchers Dr. Giselle Beiguelman, Dr. Bruno Moreschi and Rafael Pagatini, whose artistic projects are questioning traditional museological narratives and problematizing the colonialist gaze in museum collections using digital tools.

## Keywords

Digital archives, digital agency, Artificial Intelligently, social media, Internet Studies, Museum Studies, Decolonial

## Introduction

What is the future of the museum? This very question reappears whenever we go through moments of great historical and social transformations. For the first avant-garde movement at the beginning of the 20th century, the future of museums was their destruction. Incinerating the past was the only way to open the path to a new form of truly living art, created from its ashes that would be accommodated on a pharmacy shelf, as Kazimir Malevich defended in "On the Museum" (1919). His idea is the antithesis of the memorial discourses that emerged in the memory boom of the 1980s: at that moment, the question gave way to a statement - and the future seemed to be in the museum. These spaces were seen as a solution to the temporal fragmentation of the present and a way of dealing with a traumatic past, marked by wars and destruction.

This very debate has resurfaced since the beginning of the COVID-19 pandemic. In *The Future of the Museum* (2021),

András Szántó presents the same question to 28 directors from institutions around the world. For Marc-Olivier Wahler, director of the Musée d'Art et d'Histoire (MAH) in Geneva, the ideal "post-museum" should work more like software than hardware. As with a computer, Wahler imagines a future for museums in which they can be molded into different formats without losing their identity, not limited to a single space or experience.

This reading resonates with the questions that we aim to discuss: How to elaborate methodologies using digital tools and the audience's digital agency to dismantle museum discourses, a process that we call the *demusealization of the museum*? If museums are on the spotlight again in this "third memory boom" (Hoskins, 2017), when a more participative and effervescent digital modes of circulation and connectivity has transformed previous modes of memory representation, in which way these spaces could still be relevant in a context where institutions are deeply implicated in the debate about decolonial, restitution and reparation? Having this in mind, this round panel, moderated by Nathalia Lavigne, will discuss artistic projects by Dr. Giselle Beiguelman, Dr. Bruno Moreschi and Rafael Pagatini that are questioning traditional museological narratives and problematizing the colonialist gaze in museum collections using digital tools.

The notion of institutional critique 2.0 was devised by Bruno Moreschi and Gabriel Pereira after a research project conducted at the Van Abbemuseum collection (Eindhoven, NL), in which they created a reading process of their artworks through six commercial image-recognition Artificial Intelligences systems. Among their aims of this experimental methodology was denaturalizing AI's gaze, looking at these systems as a way to expand poetic layers of art beyond its marketing and efficiency-focused logic.

A similar methodology has also been developed by Moreschi, Giselle Beiguelman and Bernardo Fontes in the ongoing project *Demonumenta*. It proposes a debate on the coloniality that is embedded in several public institutions and collections, developed by students and faculty members at FAUUSP in dialogue with other institutions and research centers. In this panel, Beiguelman and Moreschi will focus on one artistic investigation presented in the context of the ZKM's

intelligent.museum residency. In *(De)composite Collections*, they analyzed the collections of two Brazilian museums throughout AI reading systems using these datasets algorithmically processed with GANs to question what other art histories might emerge from AI's readings of the images, and how these systems could contribute to understand the gaze as a historical construct.

Rafael Pagatini will present his research on the importance of digitalization in cultural institutions, focusing on his own experiences on the access to infrastructural information in museum archives. Documents and photographs about the institution can contribute to new ways of resignifying the museum and its collection by creating dialogues with the socio-historical-cultural conflicts that have permeated the museum over time. This study will also discuss how these dynamics are reproduced in the access to documents about the relationship between these cultural institutions and the civil-military dictatorship in Brazil (1964-1985).

Lastly, Nathalia Lavigne will present some results of the field research at the Humboldt Forum, in Berlin, in which she analyzes both some audience participation initiatives on social networks and programs led by this institution that can be seen as examples of demusealization of the museum. It includes, for instance, a comparative analysis between the hashtag #HumboldtForum on Instagram and the museum official account, trying to find points of convergence and differences between de-musealization practices carried out by the audience and by the institution itself.

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## Authors' Biographies

Nathalia Lavigne

Art writer and curator, a Ph.D. Candidate at Architecture and Urbanism College, University of São Paulo (FAUUSP) and a former visiting scholar at The New School. She is a contributor to Artforum International Magazine, Contemporary And (C&), Folha

de São Paulo, among others; and has an MA in Cultural and Critical Studies from Birkbeck, University of London. Among the exhibitions she curated are "Against, Again: Art Under Attack in Brazil" (2020), at the Anya and Andrew Shiva Gallery, New York; and Disappearance Tactics (2021), at Paço das Artes, São Paulo. She is currently a visiting researcher at Humboldt-Universität zu Berlin, and have been awarded a DAAD scholarship in 2021.

Bruno Moreschi

Researcher and multidisciplinary artist. Postdoctoral fellow at the Faculty of Architecture and Urbanism at the University of São Paulo (FAUUSP), PhD in Arts at the State University of Campinas (Unicamp), with a Capes scholarship, and exchange at the University of Arts of Helsinki (Kuva Art Academy), Finland, via CIMO Fellowship. Projects recognized by scholarships, exhibitions and institutions such as ZKM, Van Abbemuseum, 33rd Bienal de São Paulo, Rumos Award, Funarte, Capes and Fapesp. He is currently a researcher on the Histories of AI: Genealogy of Power / Mellon Sawyer Seminar (Cambridge University), senior researcher at the Center for Arts, Design and Social Research (CAD+SR) and one of the coordinators of GAIA /C4AI/Inova USP. <https://brunomoreschi.com>

Giselle Beiguelman

Artist and Professor at the School of Architecture and Urbanism at the University of Sao Paulo, Brazil. She is also a member of the Laboratory for OTHER Urbanisms (FAUUSP) and co-coordinator of GAIA (Grupo de Arte e Inteligência Artificial – INOVA USP). Her interests include the aesthetics of memory and contemporary nomadism. Among her recent works are the Portuguese-language Hateland, covering online reactions to violence against vulnerable groups in Brazil; a co-authored book about the storage and preservation of digital artworks; and an on-going investigation of the colonialist imagination in 20th century artworks using artificial intelligence. Author of many international award-winning projects, her artworks are part of museums collections worldwide, such as ZKM (Germany) and Pinacoteca de S. Paulo (Brazil). <https://desvirtual.com>

Rafael Pagatini

Artist, researcher and assistant professor at the Federal University of Espírito Santo, Brazil. Pagatini is currently a PhD candidate in Visual Arts at the State University of Campinas, São Paulo. In 2020, he was a guest researcher at the Hannover University of Applied Sciences and Arts, Germany. He has held individual and collective exhibitions in Brazil and abroad: Shiva Gallery, New York (2020), European Center for Constitutional and Human Rights, Berlin (2019); Leipziger Baumwollspinnerei, Leipzig (2019); Columbia University, New York (2018); 20th Contemporary Art Festival Sesc\_Videobrasil, São Paulo (2017); Paço das Artes, São Paulo (2016); Rumos Itaú Cultural, São Paulo (2013). <https://rafaelpagatini.com>

# “Right-Click To Save: Preservation, NFTs, and Distributed Ledgers”

John P. Bell<sup>1</sup>, Regina Harsanyi<sup>2</sup>, Jon Ippolito<sup>3</sup>

<sup>1</sup>Dartmouth College, Hanover, NH, USA; john.p.bell@dartmouth.edu

<sup>2</sup>Independent Curator, New York City, NY, USA; regina.harsanyi@gmail.com

<sup>3</sup>University of Maine, Orono, ME, USA; jippolito@maine.edu

## Abstract

Artists have experimented with cryptocurrency incentivized distributed ledgers such as blockchains since the advent of Bitcoin. In parallel, crypto advocates frequently claim that distributed ledger protocols will ensure an accessible and immutable record of anything registered to it, including artwork. This panel examines this idea with nuance, neither buying into the mass deception around NFT marketing tactics nor rejecting the reality that a subset of artists are creating significant, challenging works that inherently utilize these technologies. Preserving the asset may seem to be in the regular wheelhouse of preservation professionals, who have decades of experience developing guidelines for saving software-based art, but ledger-based technologies have their own preservation promises and challenges.

## Keywords

Non-Fungible Tokens, Preservation, Distributed Ledger, Blockchain, Digital Art, Emulation, Variable Media

## Distributed Ledgers and Preservation

A claim frequently repeated in the last year by advocates of blockchains and NFTs is that distributed cryptographic ledgers will ensure an accessible and immutable record of born-digital and digitized art for posterity. This panel examines this idea in a nuanced way that neither buys into the hype around NFTs nor rejects the reality that artists are experimenting with these technologies. The analysis draws on cutting-edge experiments such as archival packages prepared for artworks that utilize distributed ledgers, as well as historical precedents such as net art collected by museums. While the field is still in its infancy, the presenters forecast the viability of the most promising proposals for preserving, and being preserved by, the blockchain.

Media coverage and competing narratives around NFTs have clouded collective understanding of these concepts so it is important to clarify what is meant by these terms:

A **distributed ledger** is a database that is consensually shared and synchronized across multiple nodes. Unless specially encrypted, the participant at each node of the network can access the recordings shared across that network and can own an identical copy of it. Any changes or additions made to the ledger are reflected and copied to all participants in a matter of seconds or minutes.

A **blockchain** is the most popular example of a distributed ledger, using a block data structure with the primary objective to record verifiable transactions.

An **NFT (Non-Fungible Token)** is a set of electronic instructions called a “smart contract,” with a unique cryptographic hash published to a distributed ledger that can reference virtually any object, tangible or digital.

A **distributed storage protocol** is peer-to-peer network for storing and sharing data, distributed on multiple file servers or multiple locations. It allows programs to access or store isolated files redundantly, allowing programmers to access files from any network or computer.

## Myths and reality

This discussion will not assess the aesthetic quality of artwork registered to a blockchain, nor directly tackle the economic and environmental benefits and costs of NFTs. Nevertheless, we will start by separating fact from misperception in claims made by crypto enthusiasts that impact new media preservation.

## NFT standards were created to store artwork on chain

**False.** Although the ERC-721 and 1155 standards were created, in part, with artwork in mind[1], the blockchains in which artists are minting NFTs can only practically store small amounts of data. To store 1GB on the Ethereum blockchain could cost over four million dollars[2], and the entire chain currently stores less than 5TB due to the complexity required to validate the entire ledger. For NFTs, the solution has been to point to large media files like JPEGs and MPEGs on other servers or networks. When you buy an NFT, you are typically buying the pointer, not the asset. This is why crypto enthusiasts mock skeptics who claim to be able to steal their NFTs by right-clicking to save; this may download the image of a bored ape, but its token is bound to the blockchain.

## NFTs transfer copyright

**False.** In most cases, buying an NFT does not convey any public rights to the asset to which it points.[3]

### **NFTs establish a transparent provenance for digital art**

**Maybe.** In theory, every blockchain transaction is public; unfortunately, some intermediary marketplaces obscure collector information[4] due to privacy concerns or technical expedience. Transactions often also take place off-chain or separate from the transfer of the NFT. Recent efforts by blockchains such as Secret Network, third party encryption such as Pinata's Submarine[5], and the promise of zero knowledge proofs put transparency at increased risk.

### **Digital art can finally be collected thanks to NFTs**

**False.** Museums have collected digital art since at least 1995[6], and at this point many have explored thoughtful protocols for conserving digital media. NFTs add new options but do not solve all the challenges of collecting bits.

### **Positives and Negatives**

Myths aside, does the blockchain at least preserve digital art for posterity? We can examine this claim in by examining the potential and pitfalls of NFTs as a preservation tool.

#### **Benefits: On-chain preservation**

For those works concise enough to store on the blockchain, it offers more secure storage than the typical archival hard drive or cloud service. This can be true for a selection of artists who create code-based works, such as John F. Simon Jr, and for conceptual works by artists who use the blockchain as a medium, such as Rhea Myers.[7] However, as long as the visual or sonic aspects of the work need to be rendered, even these genres require external dependencies.

#### **Benefits: Distributed storage solutions**

For the vast majority of works too large to store on the blockchain, platforms built around NFTs often automatically upload assets either to their own centralized server or a distributed storage solution like IPFS (InterPlanetary File System). Technologically, peer-to-peer networks like Protocol Labs' IPFS and Filecoin, which also break down data into blocks, are more resilient than traditional storage options maintained by a single organization or company, though they depend on community upkeep to sustain. In principle, such networks can also preserve conservation-related documentation as well as the works themselves.

#### **Benefits: Financial incentives**

While traditional collecting institutions depend on grants or donations, blockchain-based preservation systems like Filecoin and Arweave leverage their intrinsic cryptocurrencies to pay anyone willing to maintain a node in their networks.[8] This automated protocol provides a potential income to support community preservation.

### **Challenges: Limited media**

Storage on the blockchain can be very limited due to the high cost of verification. This leaves out the majority of visual, sonic, and time-based media that can't exist as a single files containing a low-resolution bitmap, simple SVG, or a few lines of unminified code for generative outputs.

### **Challenges: Links to metadata**

NFTs include a token URI that acts as a pointer, but rarely do they point to artworks directly. Instead tokens typically link to a JSON metadata file off-chain, whether it be stored by a node operator on a distributed storage protocol or a centralized server. These JSON files in turn point to the singular object file and preview image and rarely a complete archival package. Access to these JSON files are in themselves vulnerable to loss or corruption.

### **Challenges: Dependence on crypto currency value**

Services like Filecoin aim to get around the dependence on volunteer labor by paying contributors in a dedicated cryptocurrency. The impact of such financial incentives rise and fall with notoriously volatile cryptocurrency values.

### **Challenges: Obstacles to migration**

Artworks with digital components frequently need to migrate over space (as in the case of an installation loaned from one museum to another) as well as over time (as in the case of an obsolete format converted to a newer, supported format). It's unclear how such changes would be compatible with artists that mint with immutable URIs to the blockchain. Blockchain advocates tout the immutability of content on the chain, not realizing that variability is important to digital preservation and display.[9]

### **Challenges: Dependence on platforms**

In part due to the learning curve of writing smart contracts, most artists rely on centralized NFT marketplaces and lookup tools with simple interfaces for uploading and displaying assets.[9] These platform interfaces do not tend to take metadata fields into account that are used elsewhere in the contemporary fine arts. Although institutions have developed several metadata for documenting born-digital and digitized components, none of these approaches are addressed in existing NFT publishing platforms. This means that in some cases if the platform goes down, the metadata accessible via the ledger could be missing essential information, including even the name of the artist. Platform-imposed file sizes, meanwhile, require artists to upload compressed file formats whose resolution and bitrate may not properly scale to exhibition dimensions and create bigger problems for conservation efforts.

### **Challenges: Dependence on external code**

Storing codebases for certain software-based works has become a niche model, championed by platforms like fxhash or Art Blocks, the latter of which asks artists to limit their dependencies to one third-party library such as p5.js. While promising, this is far from a surefire solution for preservation; apart from the lifespan of the blockchain or library itself, access to the code does not guarantee knowledge of how its output should be displayed as technologies and viewer expectations change over time.

### **Challenges: Vulnerability of blockchain “culture”**

Some of the most interesting developments in NFTs aren't files like pixelated profile cartoons but the communities that have sprung up around them. Loot, for example, started as a generated list of items from a Dungeons and Dragons-style game in a smart contract. Fans wrote lore about these virtual objects and even fabricated tangible versions. None of this lore is captured by a blockchain.

## **Approaches to preserving NFTs and their assets**

### **Archival packages**

The first and only cross-chain models in practice for preserving non-fungible token data and associated assets were created and put into practice by Protean, a variable media art conservation initiative for educating, practicing, and publishing novel standards for emerging technologies in both the public and private sector. Protean is a work in progress that aims to draw expertise from a global working group of digital conservators. Other projects with preservation-inspired methods include Club NFT and Kanon 21, but neither addresses preservation through the lens of media art conservation ethics. Both Club NFT and Kanon 21 in their current state also have distinct points of failure, such as a broken APIs or unnecessary tool layers that obscure the preservation process instead of educating the end user.

The Protean method, on the other hand, dodges platform impediments by preparing archival packages off-chain first and working with artists to generate URIs for long-term maintenance plans, which are then referenced in the smart contract metadata. They often hold multiple files, including uncompressed, lossless archival copies, README.txt files, detailed manuals, technical artist questionnaires that emphasize media-specific assessment, and supplemental documents.

In comparison with the 100MB restrictions afforded by a majority of platforms, Protean file sizes would depend on needs specific to the artist or subsequent collectors, and only limited by the available hardware, software, and finances. These packages can be hundreds of GB, and discoverable at either a web domain maintained by the artist studio or an IPFS-generated hash for a directory without recording a

specific gateway URL, which would be a platform dependency.

The history of net-based art conservation has exposed many tales of link rot. Protean takes this into account by educating artists and art custodians on generic digital strategies such as migration, but also newer tactics such as becoming Filecoin and IPFS node operators themselves, inherently incentivized to redundantly store each other's encrypted assets in perpetuity.

This process also takes into account the reality that immutability is antithetical to media art preservation. Unlike the singular asset associated with typical NFTs, a Protean link might point to a range of releases that are added to an artist's server or an IPFS directory as the work is updated over time.

### **Emulation**

The above strategies are useful for access and preservation of associated assets that do not inherently require the chain in which they were minted but do not address preservation of works that do treat any aspect of the particular distributed ledger technology as an essential aspect of medium or performative behavior. Blockchain verification depends on node operators, who are normally driven by the promise of crypto-currency rewards. These ledgers may lose their current cohort of node operators to more exciting incentives and systems in the future. At this time there are over 5,000 publicly known full node operators on Ethereum,[10] which has already fluctuated wildly since February 2021 when there had been over 12,000.

Though it may seem a counterintuitive approach to preserving a distributed system, it is possible to emulate on a centralized system an entire set of blockchain nodes to preserve a distributed ledger. Emulation may be appropriate once the original chain or supporting dependencies become unavailable or somehow in dispute: a particular ledger system may lose popularity and not have enough participating nodes to continue, the ledger itself may fork for technical or social reasons, or external links stored in the ledger may go stale.

Since node management software for many chains is commonly available as containerized packages—for example, Docker containers describing Ethereum nodes—a single node will often be running in emulation even before any preservation efforts. Running several containerized nodes together on a single machine is simply a matter of launching multiple iterations of the same container. The container nodes can then be connected with internal networking to create a multi-node private network on a single computer that mirrors the public system currently distributed across hardware around the globe. If given a copy of the current state of the ledger, the entire system can be treated as a self-contained backup that recreates both the stored data and active behaviors of that network.

Technical convenience does not imply emulation is always the best solution, however. An emulated private node network only preserves data in the ledger itself; since ledger data is often a pointer to outside media, code, or assets, those outside resources may also need to be emulated. A work may depend on the activity of public users or new data being added to a ledger that is now isolated from the outside world. In cases where such considerations are not critical to the work, though, emulation offers the ability to simply reproduce a complex technical ecosystem.

### Media-independent assessment

Another integration of crypto art into current conservation practices would be to take the approach of the Variable Media Questionnaire,[11] which records opinions about how to preserve creative works when their current medium becomes obsolete. Its users can compare these opinions as they vary by work, by interviewee, and by date.

The current version of the Questionnaire looks at artworks as ensembles of Parts, though its purpose is less to track sundry gadgets like cables or disk drives than to understand the key elements of a work that are critical to its function, such as source code or media display. Acknowledging the relational character of much contemporary art, these Parts extend beyond hardware to include environments, user interactions, motivating ideas, and external references. Structuring the Questionnaire in this way makes it easier to compare different artworks created with similar parts.

The Variable Media Questionnaire could be leveraged to help preserve blockchain art by creating a dedicated Package. A variable media Package is an ensemble of Parts that might be used in common creative formats, from paintings to video installations to websites. Some of the questions in a blockchain Package would overlap with other formats, such as the resolution or color depth of a digital image, or what happens to user contributions when a work is loaned. Others might be specific to the blockchain, such as what to do when a chain forks and how critical a given cryptocurrency is to the work's function.

### Conclusion

The vulnerabilities of distributed ledgers suggests that such systems are unlikely to suffice as a preservation solution, including works created on the blockchain itself for art in the future, and in fact may make a preservationist's job more difficult. Nevertheless, the authors believe that a significant slice of artworks using these technologies are worth saving for the future. Emulation offers a promising strategy for re-creating the content and technical functions of an extinct blockchain, but it is less suited to re-creating the social dimensions of a blockchain-based artwork. Rather than a one-size-fits-all preservation solution for these works, we recommend a case-by-case analysis of the best way to

translate the artistic qualities of the work into future scenarios in which the original chains and associated services are defunct.

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## Authors Biographies

John Bell directs the Data Experiences and Visualizations Studio at Dartmouth College; Regina Harsanyi is a media art specialist who advises museums, artist studios, galleries, and private collections on curation and preventive conservation of variable media art; and Jon Ippolito directs the Digital Curation program at the University of Maine.

# Emerging Collaborative Preservation Projects in Asia

**Moderators: Myra CHAN, John CHOW**

Affiliation (s): Videotage

**Panelists: Kyle CHUNG, Joel KWONG, SU Wei**

Affiliation (s): Videotage, Microwave International New Media Arts Festival, Tsinghua University Art Museum

Location, Country: Hong Kong and Beijing, China

Contact Emails: [myrachan@videotage.org.hk](mailto:myrachan@videotage.org.hk) , [johnchow@videotage.org.hk](mailto:johnchow@videotage.org.hk)

## Abstract

It has always been the case that artistic and cultural practices transform with new technologies. As technology constantly evolves, contemporary artistic practices have increasingly engaged with non-traditional media. Museums, galleries, and art institutions are adapting their approaches to the presentation, dissemination and preservation of new media art. While media artworks and exhibitions are ubiquitous nowadays, archiving plays an important role in preserving history and generating knowledge of art. What are the needs and challenges of developing a media art archive? How can art archives encourage interdisciplinary collaboration to facilitate contextualization, preservation and presentation of artworks?

As a media art archive based in Hong Kong since 2008, Videotage Media Art Collection (VMAC) has continued its development with the expansion of its collection of artworks from Hong Kong to China, Taiwan and Macau in recent years. Esteemed curators from nearby regions are invited to collaborate for the acquisition. Local researchers are invited to study and write about the VMAC archive, providing reflections and new perspectives in media art archiving. This panel brings together art professionals, researchers and scholars to share their collaboration experiences and look at the issues of archiving media art in Hong Kong and China, and beyond.

## Keywords

Media Art, Art Archives, Collaborative Preservation, Contemporary Art, Hong Kong, Asian

## Introduction

In the panel, media art curator and researcher Kyle Chung will share his experience of Minecraft residency and NFT art project and their related preservation challenges. Joel Kwong, programme director of Microwave International New Media Arts Festival, will talk about her selected media art projects and the challenges during the pandemic.

Su Wei, curator of VMAC's China Collection, will share his collaboration with Videotage in driving forward the video art collection in the Greater China Region.

## Biography

Videotage:

Founded in 1986, Videotage is a leading non-profit organization in Hong Kong focusing on the presentation, promotion, production and preservation of video and media art, serving artists in the expanding technological art and culture network. Dedicated to nurturing emerging media artists and developing the local media arts community, Videotage has organized numerous media arts events and programs while developing an extensive offline and online video art archive, Videotage Media Art Collection (VMAC).

Kyle CHUNG:

Kyle Chung is a curator and researcher whose recent exhibitions explore the dynamics between technologies, materiality and human agency. Selected exhibitions include *2<sup>3</sup> or Not 2<sup>3</sup>: East Kowloon is on Minecraft in New Vision Arts Festival*, Hong Kong; *Ellen Pau: Time After Time Will Tell at 1961*, Singapore; *#YOU #ME #ourSELFIES* at Hong Kong Visual Arts Centre; *One World Exposition 2.1: #like4like* at chi K11 art space, Hong Kong; *Carla Chan: To Outland* at SMAC, Berlin, Germany; *Conjunctions and Disjunctions: International Symposium on Electronic Art 2016*, Hong Kong; *Bright Shadow* at The Morgue, London, UK. With a PhD in Creative Media, Chung is currently an independent curator; Curator at Videotage, Hong Kong; and Lecturer at School of Creative Media, City University of Hong Kong.

Joel KWONG:

Joel Kwong is an international media art curator, writer, producer and educator based in Hong Kong. She is currently the Programme Director for Microwave International New Media Arts Festival, as well as the founder of SIBYLS – a creative consultation and production agency. Kwong has a strong belief in the power of art and technology, and her curated projects have been shown in many different cities around the globe. Her most recent projects in 2021 includes Future Media Art Festival in Taiwan, Microwave Festival edition 2021, Glow Shenzhen online media art showcase “Fireflies: The Glowing Dots”, Connecting the Dots – a media art archaeology online exhibition & website etc.

She has years of experience in doing education and on international jury panels, such as Siggraph Asia 2020(South Korea), ISEA 2019 (Gwangju), 2015 Taiwan Golden Pin Awards, Siggraph Asia in 2011 & 2013, and ISEA (HK) in 2016. She has also given talks and lectures at many different festivals and institutions, including Ars Electronica in Linz, Transmediale in Berlin, Shenzhen Media Art Festival; ACT Festival in Gwangju, South Korea; the University of Electro-Communications in Tokyo; and FILMART in Hong Kong.

SU Wei:

Su Wei (born in Beijing) is an art writer, art history researcher and curator based in Beijing. He is currently Researcher at the Tsinghua University Art Museum. He participated in the 2012 Curatorial Intensive at Independent Curators International (ICI) in New York. In 2014, he was awarded first place at the first International Awards for Art Criticism (IAAC). He worked as the Senior Curator of Beijing Inside-Out Museum between 2017 and 2021.

Su Wei's work in recent years focuses on re-constructing the narrative—and radical imagination—of contemporary Chinese art history, and explores the roots of the legitimacy and rupture of contemporary Chinese art history in a global context. Pivotal to his work is the attempt to take the “post-1949” as the key in understanding artistic production in a contemporary situation, and in so doing he seeks to re-define the stance and possibilities of art in nowadays China. He thus engages in an anti-establishment critical practice by mapping the limits, contextual clues and unconscious energies of the post-1949 art production, which figures the dual presence of decay and emptiness.

**Second Summit on  
New Media Art Archiving**

**ISEA2022 Barcelona  
10-16 June 2022**

**New Media Art Archiving**

**Barcelona  
10-16 June 2022**

**-Round Tables-**

# Roundtable on Ethics and New Media Art Archiving

**Lisa Deml**

Birmingham City University  
Birmingham, United Kingdom / Berlin, Germany  
[lisa.deml@mail.bcu.ac.uk](mailto:lisa.deml@mail.bcu.ac.uk)

**Nathalia Lavigne**

Universidade de São Paulo  
São Paulo, Brazil / Berlin, Germany  
[nlavigne@usp.br](mailto:nlavigne@usp.br)

## Abstract

In recent decades, new media art archives have multiplied and diversified across digital networks and online platforms, contributing to the creation of instant and unruly archives that often emerge in unforeseen and involuntarily ways. Concomitantly, our relationships with archival documents, new media, art institutions, and the historical, social, and political realities they pertain to have changed. Based on case studies discussed in previous panels, this roundtable addresses participants, first and foremost, as viewers themselves to think about how visual and archival literacy can be disseminated in order to respond to this unprecedented proliferation of new media art archives in more critical and engaged ways. Beyond questions of authorship, ownership, copyright, and consent, we will address issues around responsibility, authority, dignity, colonialism, and care to draw out the differences between performing and practicing ethics in and of new media art archives. Encouraging self-critical and self-reflexive perspectives, this roundtable invites users, artists, curators, and scholars to confront the complex and often ambiguous ethics vis-à-vis the subjects of new media art archives and to recognise our agency as well as complicity in ethical transgressions as equally responsible viewers and listeners.

## Keywords

Ethics, archives, public domain, agency, responsibility, authority, dignity, care, gaze, visual literacy

## Introduction

New media art archives have multiplied and diversified across digital networks and online platforms. Within them, temporal as well as geographical distances collapse, and the role of the 'archon' or 'gatekeeper' is distributed among algorithms, content moderators, curators, researchers, and a multitude of users. The dissemination of social networks in recent decades has brought about new issues for archival practices which take place in a grey zone between social

interaction and communication, contributing to the creation of instant and unruly archives that often emerge in unforeseen and involuntarily ways. Concomitantly, our relationships with archival documents, new media, art institutions, and the historical, social, and political realities they pertain to have changed. Against this background, this roundtable invites users, artists, curators, and scholars to address the complex and often ambiguous ethics vis-à-vis the subjects of new media art archives and encourages us to recognise our agency as well as complicity in ethical transgressions as equally responsible viewers and listeners. Rather than a means to an end or a predetermined code of conduct, we consider ethics as a practice, a means in and of itself. As such, an ethical practice in and of new media art archiving must continually be redefined and situated within particular material contexts and intersubjective relations. The point of departure for this discussion is the network of relations that unfolds between producers, subjects, archivists, mediators, and viewers, as well as the various forms of responsibility and agency that are inherent and negotiated therein. Based on case studies discussed in previous panels, we intend to deepen the debate from the spectator's point of view to think about how visual and archival literacy can be disseminated in order to respond to this unprecedented proliferation of new media art archives in more critical and engaged ways. Crucially, while this roundtable draws on individual fields of expertise, it seeks to engage participants, first and foremost, as viewers and to delineate their realms of agency and response.

Beyond questions of authorship, ownership, copyright, and consent, this roundtable raises issues around authority, dignity, colonialism, and care to draw out the differences between performing and practicing ethics in and of new media art archives. How can we address the absences within new media art archives, transcend the taxonomic structures that pervade them, and subvert the ideological frameworks that surround them? And how might our own patterns of

recognition and representation be complicit in perpetuating neocolonial narratives and neoliberal economies? What is the responsibility of the artist, curator, scholar, and, by extension, the viewer in relation to the people whose recorded images or voices are being recontextualised and repurposed through acts of archiving? Who is speaking to and for whom—and how can we, as viewers, respond in ways that disrupt and intervene in prevailing hegemonic hierarchies and historiographies?

Encouraging self-critical and self-reflexive perspectives, participants will be invited to question their own patterns of recognition to confront the agency as well as complicity in seeing, listening, and engaging with new media art archives. In doing so, the roundtable aims to untangle the complex correlations between the public domain, artistic and moral rights, and the ethical concerns and responsibilities inherent therein. Ultimately, an ethics in and of new media art archives falls on the given viewer; hence, how can each of us take responsibility for our own gaze?

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## Author Biographies

Lisa Deml is a Midlands4Cities funded doctoral researcher at Birmingham City University. She holds degrees in Art History and Philosophy from the Courtauld Institute of Art, London, and the Ludwig-Maximilians-University, Munich. Initially trained as a journalist, she subsequently worked for public cultural institutions and non-profit organisations internationally, including Haus der Kulturen der Welt (HKW), Berlin, Haus der Kunst, Munich, and Ashkal Alwan, Beirut. Her research interests focus on visual articulations of citizenship, particularly in the framework of documentary and new media practices in the Middle East and North Africa.

Nathalia Lavigne is an art writer and curator, a Ph.D. Candidate at Architecture and Urbanism College, University of São Paulo (FAUUSP), and a former visiting scholar at The New School. She is a contributor to *Artforum International*, *Contemporary And (C&)*, *Folha de São Paulo*, among others; and has an MA in Cultural and Critical Studies from Birkbeck, University of London.

Among the exhibitions she curated are *Against, Again: Art Under Attack in Brazil* (2020) at Anya and Andrew Shiva Gallery, New York; and *Disappearance Tactics* (2021) at Paço das Artes, São Paulo. She is currently a visiting researcher at Humboldt-Universität zu Berlin, and has been awarded a DAAD scholarship in 2021.

# Towards a Global Distributed Network of New Media Art Archives

**Bonnie Mitchell, Oliver Grau**

Bowling Green State University; University for Continuing Education  
Ohio, USA; Krem, Austria  
bonniem@bgsu.edu; oliver.grau@donau-uni.ac.at

## Abstract

Online new media art archives exist throughout the world and contain a rich history of the research, events, artifacts, and people that helped to define the field of new media art. The purpose of this round table discussion is to brainstorm the idea of developing a world-wide network of online new media art archives. This distributed connection among archives would enable easy access to related information and benefits both users and archive administrators. This effort raises many questions and presents unique challenges but through the input of the new media art archiving community, solutions and a path forward will be forged.

## Keywords

archive, digital art, new media art, connection, world-wide network

## Introduction

The need to preserve artifacts and information related to the history of new media art has fostered the development of numerous physical and web-based archives throughout the world. Although the physical preservation of new media art is both essential and a topic worthy of in-depth discourse, this round table discussion focuses on the on-line archiving of documentation of new media art and related research, events, and contributors. The vision is to establish a world-wide network of online new media art archives, and this round table presents an opportunity for members of the archiving community to contribute their ideas, concerns, and solutions.

## History

The conversation regarding creating connections between new media archives began with the Liverpool Declaration which specified that global networked collaboration between media art organizations, archives, and individuals was essential. A round table discussion was organized by Wim van der Plas for the ISEA2019 symposium which attracted over 50 attendees. It became clear that the time was right to begin work on a systematic approach to connect new media archives. The first Summit on New

Media Art Archiving was held online during ISEA2021 and featured 16 presentations from 12 different countries along with 3 parallel round table discussions focusing on connecting new media archives, creating ties to museums, and funding for new media archives. Representatives from ISEA, SIGGRAPH, ADA, Ars Electronica and the FILE Festival archives also met throughout the year to discuss goals, challenges and implementation methods. Programmers from the SIGGRAPH archive met with programmers from FILE to create code to begin the process of connecting the archives. In 2022, the ISEA and SIGGRAPH archive teams organized the Second Summit on New Media Art Archiving. With 52 presentations from 17 countries including paper presentations, panels, round table discussions, artist talks and a virtual exhibition of artwork, the summit advances the conversation and paves a way forward in our efforts to create this global network.

## Connecting Archives

To enable access to information in online new media art archives, one must first know they exist and how to navigate unique user interfaces and information architectures. The effort to establish a distributed network of new media art archives aims to provide a way to easily traverse the broad range of archives containing related information. This effort raises questions related to funding, technology, shared data resources, unique name authority files, on-going support, and more. Connecting archives throughout the world poses unique challenges, and this discussion addresses these concerns and also invites innovative ideas to move forward with this initiative.

## Co-Moderators

Bonnie Mitchell is a co-director of the ACM SIGGRAPH History and ISEA Symposium archives. She currently is a member of the ISEA International Advisory Committee and the SIGGRAPH History and Digital Arts Committees.

Oliver Grau is the director of the Archive for Digital Art (ADA) and author of *Mediale Emotionen, Imagery in the 21st Century*, *Digital Art through the Looking Glass*. He is also the founding director of the MediaArtHistories conference.