

Upstream of Obsolescence

by Eddy Colloton



TRANSFER

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About the Author

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Introduction

When an artwork enters a museum collection, it becomes codified—its components cataloged, its exhibition history tracked, its identity gradually established through documentation and display. In static media, an institution often inherits an established material configuration; in time-based media, the museum often inherits a history of change, in which the work's behavior and appearance have been repeatedly renegotiated through technical maintenance and contextual re-staging. TRANSFER's Data Trust initiative represents an effort to bring conservation practices "upstream," pairing five media conservators with five artists—Carla Gannis, Huntrezz Janos, Rosa Menkman, Lorna Mills, and Eva Papamargariti—to document and preserve their work before it enters a collection. This collaborative approach allows conservators to understand not just what choices an artist made, but why, capturing the conceptual and contextual significance that will guide future preservation decisions.

The urgency of this work is underscored by the rapid obsolescence facing software-based artworks. Across the five artist case

studies, a recurring pattern emerges: platforms disappear, companies restructure, and works that are only a few years old face insurmountable technical barriers. Carla Gannis's augmented reality activations broke when the commercial application, BlippAR restructured its platform; Huntrezz Janos's augmented reality (AR) face filters became inaccessible when Meta shut down Spark AR; Rosa Menkman's Unity-based virtual reality (VR) environment lost visual fidelity when the game engine's licensing system was deprecated. These challenges require a paradigm shift in how artworks are maintained—one of perpetual reassessment, migration, and collaboration between artists and conservators. This initiative brings together artists, conservators, collections, and artworkers at large to work together toward shared documentation goals, ensuring that variable media artworks can adapt to technology's changing architecture while maintaining their essential identity.

Conservation “Upstream” from the Museum

The moment an artwork enters a museum collection is a significant milestone. For a painting, the frame's provenance may be evaluated; a sculpture's pedestal is similarly measured and tracked (typically as an “accessory” in museum database vernacular, unless categorized as an “artist frame” or “artist base”); an installation artwork is inventoried and evaluated, its individual components categorized and cataloged. From this moment forward the light levels, damage, repair, packing, storage, temperature and relative humidity will all be tracked, documented, and (ideally) retained for posterity. The work is understood, nurtured, even.

Many works live a long life inside a museum or collection and have a chance to flourish in their institutionalized environment. Media art conservators take snapshots of these life cycles, collecting reports and noting changes over time, making entries into the museum's database the way a parent collects photos for a scrapbook. But a conservator is closer to an artwork's biographer (sometimes therapist or doctor), than the artwork's parent. The work is “born” long before the museum

“life” of the work begins. The artist creates the work in their studio. The work's childhood, adolescence, or even adulthood is often fully outside the purview of the institution. But like a therapist, the messier that childhood is, the harder a conservator's job to maintain the work.

“A conservator is closer to an artwork's biographer (sometimes therapist or doctor) than a parent.”

That's why I was excited by the opportunity to be a part of TRANSFER's ‘Care Team’. Joining this initiative afforded me the opportunity to work directly with artists to codify their own work, “upstream,” before the institutional life of the work began, an uncommon occurrence within museums. This naturally requires a much more gentle codifying (parenting) style, leaving as much room as possible for the work to grow and change before it leaves the studio (nest) to live a life of its own.

Background

TRANSFER Data Trust is a decentralized artist-owned database and archive for documenting, preserving, and valuing art. The Trust is being built, in part, to “facilitate the creation and management of archival information packages (AIPs); structured sets of digital objects and associated metadata encompassing both descriptive/contextual information and preservation/conservation documentation.”¹ The Trust is working with software developers to create an interface for this archive. The “Trust Client” they’re building will allow artists and other stakeholders to view and edit the type of documentation that typically is only seen by conservators through museum databases.

In the first phase of the project, which ran from late 2024 to mid 2025, Kelani Nichole, Founder of

TRANSFER and Regina Harsanyi, Associate Curator of Media Arts at Museum of the Moving Image and Preventive Conservator of Time-based Media, who has led conservation frameworks for the project since its inception, paired five media conservators with five artists.

To better understand the artist’s needs, and how best to preserve the artist’s work, each conservator was asked to research the artist’s practice in depth. This included discussing the tools and workflow used to create a work, as well as the motivations behind a particular process. The significance of a choice - the context the choice was made in - is just as important to understand as the choice itself. Did an artist choose to use a particular tool because it is their favorite, because it has unique capabilities, or was it simply the first tool that offered new possibilities?

Artist		Conservator
Carla Gannis	—————	sasha arden
Huntrezz Janos	—————	Nick Kaplan
Rosa Menkman	—————	Taylor Healy
Lorna Mills	—————	Eddy Colloton
Eva Papamargariti	—————	Claudia Röck

¹ Egan, Rae. "Gap Analysis of Linked Art and Related Standards for Time-Based Media Descriptive Metadata." September 24, 2025.

Contextualization and Communication

Art conservation best practices are steeped in contextualization. The American Institute for Conservation's Code of Ethics and Guidelines for Practice state that "All actions of the conservation professional must be governed by an informed respect for the cultural property, its unique character and significance, and the people or person who created it." ②

Where a work comes from, the context it was created in, directly influences the conservator's approach to documenting and preserving the work.

In the conservation of contemporary art, particularly time-based media artworks, researching the origins of an artwork frequently involves working directly with the artist. Indeed, Kate Lewis, MoMA's Agnes Gund Chief Conservator, notes that "Communicating with artists and their assistants is an almost daily part of my practice as a time-based media

conservator." ③ In a museum context, this communication takes many forms, from boilerplate questionnaires, to casual emails, or more formal artist interviews. "It is becoming widely recognized among conservation professionals that artist interviews play an essential role in the conservation of modern and contemporary artworks." ④

In his *Best practices for conservation of media art from an artist's perspective*, media artist Rafael Lozano-Hemmer alludes to the kinship between time-based media conservators and time-based media artist:

"Trust conservators! They are absolutely fundamental for your work to have a future performance. They also have a lot of experience in preserving the most diverse things

② American Institute for Conservation. "Code of Ethics and Guidelines for Practice." Accessed November 30, 2025. <https://www.culturalheritage.org/conservation-at-work/uphold-professional-standards/code>.

③ Kate Lewis, "Beyond the Interview: Working with Artists in Time-Based Media Conservation," abstract in Proceedings of Objects and Electronic Media + Objects Specialty Group Sessions, 43rd Annual Meeting in Miami, Florida; May 13–16, 2015, Volume Twenty-two (Washington, D.C.: American Institute for Conservation (AIC), 2015), 43, <https://resources.culturalheritage.org/osg-postprints/v22/lewis/>.

④ Gwynne Ryan and Steven O'Banion, "From Theory to Practice: Instituting the Hirshhorn Artist Interview Program," in Objects Specialty Group Postprints, Volume Twenty-Two, ed. Emily Hamilton and Kari Dodson, with Sarah Barack and Kate Moomaw (Washington, DC: The American Institute for Conservation of Historic & Artistic Works, 2016), 15, <http://faic.wpeenginepowered.com/osg-postprints/wp-content/uploads/sites/8/2015/05/osg022-02.pdf>.

you can imagine. Establish a dialog with them and work out a migration plan, they tend to be relieved when the artist has thought through these issues... Trust curators, but not as much as conservators... Many curators are sadly too rushed to read manuals, which is why you must trust conservators more.” ⁵

However, conservator–artist relationships are typically downstream of curatorial acquisition, limiting sustained engagement to the comparatively small subset of artists whose works have already entered the institutional pipeline. “One of the central dilemmas in art conservation is determining the extent to which conservators can intervene without compromising the artist's intent or integrity of the work... Conservators must balance the need to stabilize the artwork with respecting the artist's original vision.” ⁶

Steeped in this tradition, our team looked to the artist's process, as well as the exhibition history of their work, focusing on what may be codified as the work's defining properties.

⁵ Rafael Lozano-Hemmer, “Best Practices for Conservation of Media Art from an Artist's Perspective” (GitHub, last modified July 4, 2023, originally written 2015), <https://github.com/antimodular/Best-practices-for-conservation-of-media-art>.

⁶ Art Conservation and Artist Rights: The Visual Artists' Rights Act." The Conservation Center. Last modified March 29, 2024.

Case Studies



Precarious Inhabitants

by Eva Papamargariti



When working with Eva Papamargariti, conservator Claudia Röck identified an iteration of the single-channel video artwork *Precarious Inhabitants* (2017), which Papamargariti described as the “weakest presentation of the work” in an artist interview. ⁷

The squishy, malleable and evolving concept of a work’s identity is, in part, formed through “iterations:” the performance of an artwork, which realizes and activates its individual components into a whole.

These essential moments in an artwork’s life feature prominently in its biography. “Because a time-based media artwork is regarded as a “dynamic system” that only exists when it is installed, change materializes periodically rather than continuously, and usually occurs on the occasion of the artwork’s display. To monitor and manage this periodical change, every iteration of the artwork has to be documented separately.” ⁸

⁷ Eva Papamargariti, interview by Claudia Roeck, Zoom, January 10, 2025, transcript in possession of the author.

⁸ Joanna Phillips, “Reporting Iterations: A Documentation Model for Time-Based Media Art,” *Revista de História da Arte* 4 (2015): 168

An iteration which the artist feels does not appropriately articulate the work can be more valuable than several which are acceptable. In this case the work had been shown on a single flatscreen monitor in a well lit exhibition space.

Papamargariti's work often deals with materiality, scale and immersion. This concept is a through line from her process to her exhibitions, it underpins everything.

"I am creating the sound by using different kinds of digital tools ... Digital and analog materiality is combined in the sound. It's also a similar process with the image and the video. I always use digital tools, but many times I also use different types of recordings, with my phone camera with 3D scans with a microscopic camera, with a proper film camera. For me, these are different types of materialities that appear

on the video as different ways of looking at things and different scales." ⁹

In the same interview with Röck the artist said "The body of the viewers would encounter the scale and the bodies of these creatures, for example, that are living within the videos and the environments that I created." ¹⁰ Her ideal presentations of the work have been large scale projections in dimly lit spaces - "a type of a dark cave, a type of a cave that the body of the viewers would enter." ¹¹ The well lit exhibition space of the "weakest" presentation of the work emphasizes the significance of the immersive dark cave, and sense of scale. Each iteration brings the work's properties into sharper focus.

The display environment is essential to the work's integrity. In Pip Laurenson's foundational 2005 article "The Management of Display Equipment in Time-based Media Installations," she contends:

⁹ Papamargariti, interview by Röck.

¹⁰ Ibid

¹¹ Ibid

“A divergence of values between the artist and the museum is likely to become apparent over time...Although the museum may perceive itself as the passive custodian of the work of art, it has its own values related to the idea of the objects having evidentiary value connecting us to the past... The museum might therefore become more interested than the artist in a contextualist ontology that relates the work to the art historically and technologically determined natal environment.” ¹²

In this way the work's production history, its conceptual identity and its historical identity both inform the integrity of the work and come together to inform its defining properties. The materiality of the subject and of the viewer, their relationship to one another and to their environment, guide the choices made both in crafting and presenting the work. Identifying these properties empowers TRANSFER to maintain them throughout the work's life.

While work defining properties can act as “constants,” like magnetic poles that guide a compass, time-based media artworks are exceptional in their flexibility and variation. Inherently tied to technology, these artworks often must “migrate” (change to a similar format) out of necessity as obsolete technologies become unavailable. Evaluation of when and how to migrate an artwork is similarly drawn from the work's identity.

¹² Pip Laurenson, "The Management of Display Equipment in Time-based Media Installations," Tate Papers, no. 3 (2005), accessed November 30, 2025, <https://www.tate.org.uk/research/tate-papers/03/the-management-of-display-equipment-in-time-based-media-installations>.

The GIF Installation Art of Lorna Mills



Lorna Mills' GIF installation art draws its aesthetic from an internet abandoned by corporate owned portals like Facebook, Google and X (née Twitter). The blocky, compressed, lopping images Mills scavenges from the web's freakiest

corners have more in common with Geocities than they do with the Metaverse. True to form, Mills' software tools of choice eschew the late capitalism mainstay of software as a service. Her Windows PC is twisting into knots to keep using Adobe Flash 6, the last version before Adobe moved to the "Creative Cloud." But her mastery of the tool and others like it, such as Easy Gif Animator Pro ("the 'Pro' is an endearment" Lorna told me in an interview), are part of what makes her art so unique. These tools help to form the identity of her artwork.

Flash projects from this era of Adobe Flash are in fact just zip files, they can be extracted and their contents can be navigated like a traditional directory structure. This uniform structure, branded XFL by Adobe (not to be confused with the ill-fated football league of the same name), was designed to be "a way to represent a Flash Professional document as an XML-based, open folder of files." ¹³

¹³ Brimelow, Lee. "The XFL File Format Explained." May 4, 2010. Archived at Internet Archive, July 4, 2013. <https://web.archive.org/web/20130704153820/http://www.leebrimelow.com/the-xfl-file-format-explained/>.

The GIF Installation Art of Lorna Mills

Here's a dumbed down version of the structure of one of the Fla files:

```
flyover.xfl
├── DOMDocument.xml
├── flyover.xfl
├── Library/
│   ├── bmaps/ (These are the
│   │   individual GIFs that are "collaged"
│   │   together)
│   │   ├── Bitmap_001.gif
│   │   ├── Bitmap_002.gif
│   │   └── Bitmap_###.gif
│   └── Symbol.xml (Symbol.xml
│   │   corresponds to a function in Adobe
│   │   Flash/Animate. A 'symbol' holds the
│   │   keyframes of a particular GIF's
│   │   animations)
├── Meta-Inf/
│   └── Metadata.xml
├── Bin/
│   ├── file1.dat
│   ├── file2.dat
│   └── *.dat
└── PublishSettings.xml
```

In theory, one could excavate this directory structure and, with enough know-how, recreate an output. This would, of course, not be ideal. To that end, I've encouraged Mills to create high-quality versions of the videos she outputs that can serve as preservation copies, so that when different exhibition video formats are needed, they can simply be made from the preservation copies.

Conservation Informing Creation

Such an intervention into the artist process challenged my instincts as a conservator. I've pointed out that Mills' software tools are an aspect of her oeuvre, and the TechSmith Screen Capture (tscc) encoded AVI video files she output to could easily be an example of that. In fact, my initial recommendation was to keep the AVI files "as is," and create a more interoperable derivative to be included in the artist's archive. An alternative to the AVI files is prudent, the files Mills' was creating already won't open on macOS computers. macOS has limited support for AVI conditional on the file's codec: "Despite this format being listed among QuickTime-supported video formats, in reality, it is limited to Motion JPEG-based AVIs only that are created by many digital cameras. As for other forms of AVI media, unfortunately, Mac users will receive an error message indicating that a file isn't compatible with QuickTime Player. For example, the Cinepak codec that is sometimes used in AVI media is not recognized by the player." ¹⁴

Museums are charged with preserving and presenting art history. To that end, the institution must have an active role in maintaining a work's established identity. In conservation of contemporary art, however, best practices acknowledge that many works' identities have yet to be fully established. As conservator Joanna Phillips wrote in 2012: "In the case of very young artworks, the conservator must avoid determining work-defining properties prematurely, and more importantly, without the artist's consultation, because an overly historically sensitive approach can influence or even hinder the formation of the artwork's identity." ¹⁵

Working with artists "upstream" of the museum acquisition process is a more delicate and agile process. Our conversations create change and feedback in the artist's process, where simple requests for clarification from my museum email address did not. After discussing the AVI files with Mills', she ultimately

¹⁴ Paraskeva, Natalia. "QuickTime Won't Play AVI Files - How to Fix." Elmedia Video Player. May 26, 2025. <https://www.elmedia-video-player.com/avi-player-mac/quicktime-avi.html>.

¹⁵ Joanna Phillips, "Shifting Equipment Significance in Time-Based Media Art," *The Electronic Media Review* 1 (2012): 139–153, http://resources.culturalheritage.org/wp-content/uploads/sites/15/2016/07/Vol-1_2010_Ch-6_Phillips.pdf.

“The conservator must avoid determining work-defining properties prematurely, and more importantly, without the artist’s consultation, because an overly historically sensitive approach can influence or even hinder the formation of the artwork’s identity.”

That being said, the move away from Camtasia will result in video files that are easier to open by more users, and will, as a result, be easier to archive and preserve.

decided to adapt a new video editing software and create Apple ProRes archival copies of her video. Again, the video editing software step in her workflow is the last link in a long chain, and primarily just used to create video from a gif-based workflow, so it’s far from reinventing the wheel. She was not switching from oil paints to charcoal. Nevertheless, I had not intended to motivate such a change. In fact, I was initially dismayed that I had influenced her practice at all. Mills’ previously preferred video editing software, Camtasia, is a free, low-tech consumer software with limited output options (hence the goofy TechSmith Screen Capture encoding). I was a bit enamoured with the simplistic software approach and was concerned that I had brought a bias to the process.

A Subject Self-Defined

by Carla Gannis



Conservator sasha arden's work with Carla Gannis encountered similar discussions of software tool selection and obsolescence. Gannis began a series of drawings with herself as subject beginning in 2015. "I felt vulnerable at first, speaking more directly through my own voice, and using myself as a character in the digital narratives that seem to be my most natural form of expression" she recalled. ¹⁶

The Selfie Drawings, just one aspect of her series, *A Subject Self Defined*,

are emblematic of the artist's multi-disciplinary practice and the layers of technological mediation that define contemporary life. Gannis would begin with traditional drawings, and through a wide variety of tools, create social media posts responding to the present moment (2015-2016). Using the commercial platform BlippAR, she created AR versions of these posts - animated moving image "activations" that the viewer would experience on their personal device, suspended in their environment. The AR versions of the work were incorporated into a book which was published on the occasion of Gannis' solo gallery exhibition on November 11, 2017. The book, titled *The Selfie Drawings* contained each of the drawings Gannis had created during the series, and when the viewer pointed their smartphone at the drawings, it would activate the AR animation through the BlippAR app.

Within one year of the book being published, the BlippAR platform had changed significantly, and the AR activations were no longer working.

¹⁶ Gannis, Carla. Quoted in Annie Armstrong, "How to Draw Your Selfie-Portrait." VICE, September 19, 2015. <https://www.vice.com/en/article/how-to-draw-your-selfie-portrait/>.

This is an unfortunate, common issue in software-based artwork. Works that are only a few years old are forced into obsolescence by the ever-shifting landscape of both proprietary and open-source software platforms and the companies that manage them.

The first step for arden was research and documentation. Just as with Mills and Papamargariti, understanding how the work was made would guide the approach to preserving it. Gannis would combine static digital image and video components in a 3D space to create the AR activations, layering visual elements on X, Y, Z axes. These “elements” were created in a variety of software (Photoshop, Maya, DAZ studio), and then composited in BlippAR’s proprietary software Blippbuilder. When BlippAR went through multiple pivots in their business model, these changes led to the restructuring of the back-end of their platform. This resulted in the Selfie Drawing activations breaking down, and the Blippbuilder projects becoming inaccessible to former creators. This presented a challenge for migrating and reconstructing the work.

“Works are forced into obsolescence by the ever-shifting landscape of proprietary and open-source software platforms.”

In the course of arden’s work with Gannis, TRANSFER and the artist spoke with a rep from BlippAR about reviving the work. The company was sympathetic to the need to access the obsolete materials, but, as is the case with many software companies, maintaining backward-compatibility with every version of their software is not feasible, nor economically motivating. The rep was able to offer a copy of the assets, which are still stored on the BlippAR server, despite being incompatible with the current version of the platform.

Inspiration and Translation

When arden and Gannis began working together it quickly became clear that a new platform would be necessary to provide future access to the AR aspect of the *A Subject Self Defined* series. This is one of a limited number of options open to conservators and artists when faced with an obsoleted AR artwork. The Preserving Immersive Media Knowledge Base (founded by Tate time-based media conservators Jack McConchie, Tom Ensom, and Louise Lawson, with contributions from Claudia Roeck and sasha arden) was created to document strategies for maintaining artworks like Gannis' *Selfie Drawings*. **Virtual Reality (VR) and AR works are often built with proprietary technologies that are updated quickly, necessitating frequent intervention.** In the case of artworks with fixed aesthetics grounded in historical context, intervention requires a great deal of caution. ¹⁷

In Gannis' social media posts, which became the *Selfie Drawing* series, she was responding to the political and cultural moment of 2015-2016. Moreover, these works were created using consumer technologies of the

moment (Gannis' iPhone is featured in many of the images) and released on social media. In this way, the 'aura' of AR in 2015-2016 and its aesthetics are crucial to the work.

Defining this aura is complicated, and is once again determined through discussions with the artist and the conservator. Through a series of conversations and reflection, some of the important aesthetic qualities arden and Gannis landed on are:

- **Audio timing and quality**
- **Placement of animation within 3D space (ability to zoom in and out, to unpin from a target and place elsewhere)**
- **Seamlessly loop the animation**

Support for these features will determine the platform the work is eventually migrated over to, while of course also considering the sustainability of the platform (as best as can be determined). Targeting a future platform is just one of many steps of a migration, which can be labor and time intensive. Therefore

¹⁷ Tate, "Preserving Immersive Media," Tate, September 2018, <https://www.tate.org.uk/about-us/projects/preserving-immersive-media>.

when endeavoring to take on such a project, stakeholders hope that their painstaking recreation of a work will not simply become obsolete once again. But given the rapidly changing landscape of Augmented Reality there is simply no guarantee. Deena Engel and Joanna Phillips draw comparisons between this complicated balancing act of migration to the field of literary translation. Just as with migrating software-based artwork, translation of literary works is frequently iterative. Engel and Phillips state: “Literary translation regards itself as a means to experience a work in an authentic way. Sometimes, translations have to be updated to continue to serve this purpose. For example, a late 19th century translation of a Tolstoy novel would sound outdated to our ears today—new and updated translations are published regularly of important and well-known works. A further parallel to explore between literary translation and code migration is the role of the living author and the author’s relationship with the translator, which can be analogous to that of a conservator working with a living artist.”¹⁸ The parallels between the translation of literary works and the migration of software-based works goes further

in that the original author is often inspired by a quality which is inherently unable to be passed on to the translation. Of course literary authors are inspired by their language. Homer’s *The Odyssey* is originally written in hexameters and uses “noun-epithet formulas” to correctly fill out the meter: ““All the chief characters of the of the Iliad and the Odyssey, if their names can be fitted into the last half of the verse along with an epithet, have a noun-epithet formula in the nominative, beginning with a simple consonant, which fills the verse between the trochaic caesura of the third foot and the verse end: for instance, πολύτλας δῖος Ὀδυσσεύς (Roughly translates to “much-enduring god-like/nobel Odysseus”).”¹⁹ In this way the text of the epic poem was directly inspired by the structure of the language.

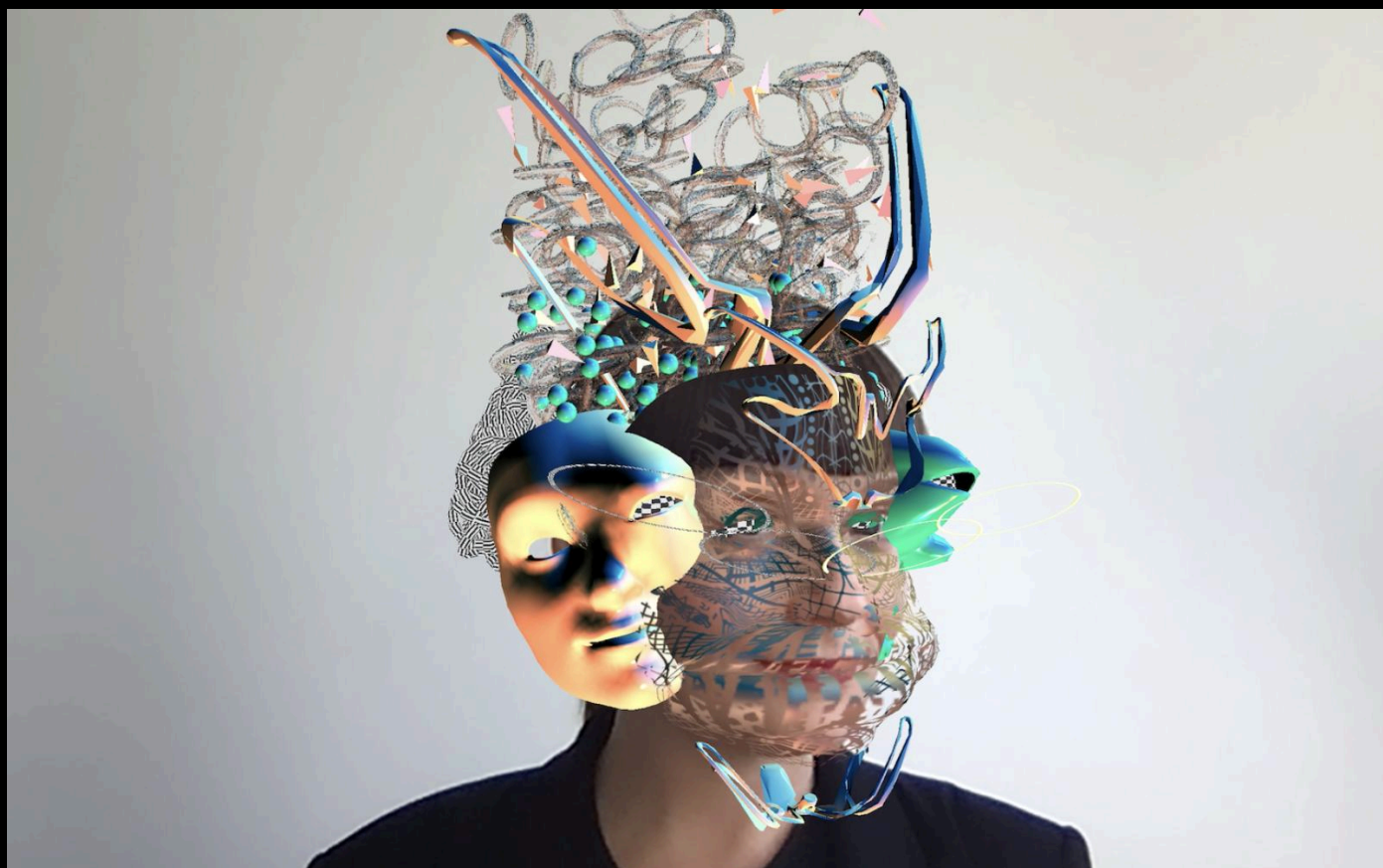
Programming languages and software platforms can similarly influence the form, and strike inspiration in media artist’s creative output. Artist Huntrezz Janos created a series of Augmented Reality face filters - masks - for the Meta Spark Player, and she too, was inspired by the form she used to create the work.

¹⁸ Deena Engel and Joanna Phillips, “Introducing ‘Code Resituation’: Applying the Concept of Minimal Intervention to the Conservation Treatment of Software-based Art,” *The Electronic Media Review* 5 (2017–2018), accessed December 7, 2025, <https://resources.culturalheritage.org/emg-review/volume-5-2017-2018/engel-2/>.

¹⁹ Parry, Milman. “Studies in the Epic Technique of Oral Verse-Making: I. Homer and Homeric Style.” *Harvard Studies in Classical Philology* 41 (1930): 73–148. <https://chs.harvard.edu/curated-article/milman-parry-studies-in-the-epic-technique-of-oral-verse-making-i-homer-and-homeric-style/>.

Infilteriterations series

by Huntrezz Janos



Drawing on the rich history of masks as symbolic narrative devices, Huntrezz creates AR face filters that introduce fantastical, “impossible” characters—avatars drawn from real, imagined, and daydreamed scenarios. Viewers can “try on” these masks in digital space.²⁰ In an artist interview with conservator Nick Kaplan, Huntrezz recalled how the Spark AR platform acted as a catalyst for her creative process:

“I saw that Spark AR was [out in Beta] and I was like, wow, this is amazing. You can do augmented reality live from your phone. When it finally was released to the public, I immediately started making filters, just experimenting and playing around with the features, but also, expressing my own joy at being able to do this [AR face filters] in a brand new way. And because I was one of the earliest adopters... The first one that I made, *Hologram Mythography*

²⁰ Nick Kaplan, "Conservation Report" September 19, 2025.

(2019-2023) was like one of the first [face filters people could use on Instagram]... And I loved that. I love to see everybody trying on this mask that I had made, and I hadn't really seen many other people doing it... So I immediately went and made another one, and then it just kept the ball rolling, and I just kept making more and expressing different aspects of myself.”²¹

Over the course of four years, Huntrezz made 25 face filter masks, part of a series titled *Infilteriterations* (2019-2023). As well as being exhibited online through Instagram, TikTok and Snapchat, the masks were shown at various exhibitions and art fairs including Tate Modern (2020), Photofairs New York (2023), Photographers' Gallery London (2023), and the sprawling historic survey *I'll Be Your Mirror: Art and the Digital Screen* at The Modern Art Museum (2023).

²¹ Huntrezz Janos, interview by Nick Kaplan, Zoom, April 29, 2025, transcript and video recording.

Dependency Obsolescence

Unfortunately on August 27, 2024, Meta announced they would “shut down Meta Spark’s platform of third party tools and media, effective Tuesday, January 14, 2025.”²² This includes the software Huntrezz used to create the masks, Meta Spark Studio, and the platform used to display the artwork, Meta Spark Player. The necessity of the player application to access the content is especially challenging from a preservation standpoint. Nick Kaplan was able to disk image a macOS computer with the necessary software installed to exhibit the work, but as he points out in his report:

“As the company no longer supports the app it is entirely likely that the installation of the app from currently existing disk images that were downloaded prior to the cessation of availability may at any time become impossible. Thus, the only way to show the artworks would be on computers that already have the player app installed. Such computers themselves must

therefore be kept un-updated as future updates to the operating systems may result in the loss of the player apps functionality. Maintaining either downloaded installation packages of the player app and/of a stockpile of computers that contain the app already is at best a short-term solution.”

The requirement to authorize the Meta Spark Player is therefore the point of failure. This is an especially challenging form of obsolescence as the dependency entirely rests in the hands of a third-party. When a software-based artwork faces obsolescence, conservators explore several paths to maintain the work, one of which is emulation. However, emulation best fits works with relatively straightforward local dependencies, for example an obsolete operating system. “Time-based media conservator Jonathan Farbowitz describes a typical emulation use case as ‘a very simple setup of software running on a single computer with a single video output,

²² Meta Spark, “A Meta Spark Update,” Meta Spark (blog), August 27, 2024, <https://spark.meta.com/blog/meta-spark-announcement/>.

and a minimum of peripherals.’ More complex use cases can come up against the limitations of emulation technology (e.g., works requiring 3D acceleration capabilities or access to peripherals).” ²³

Because the dependency of Huntrezz’s Meta Spark AR artworks rests outside of the local environment entirely, and instead on Meta’s servers, it is not a good candidate for emulation. As Engel, Falcão, Phillips, and Preserving Immersive Media Knowledge Base flounder Tome Ensom write in their chapter of *Conservation of Time-based Media Art*:

“Generally, in the context of time-based media art, high significance is attributed to functionality with the aim to preserve a functioning artwork, often overriding historical or aesthetic value of a component by allowing for its replacement. In other words, faced with a work that stopped functioning, many, but not all, artists will be happy to make changes to maintain that functionality and often to

technically improve it. The latter may raise ethical concerns, as these changes may compromise historical or aesthetic significance.” ²⁴

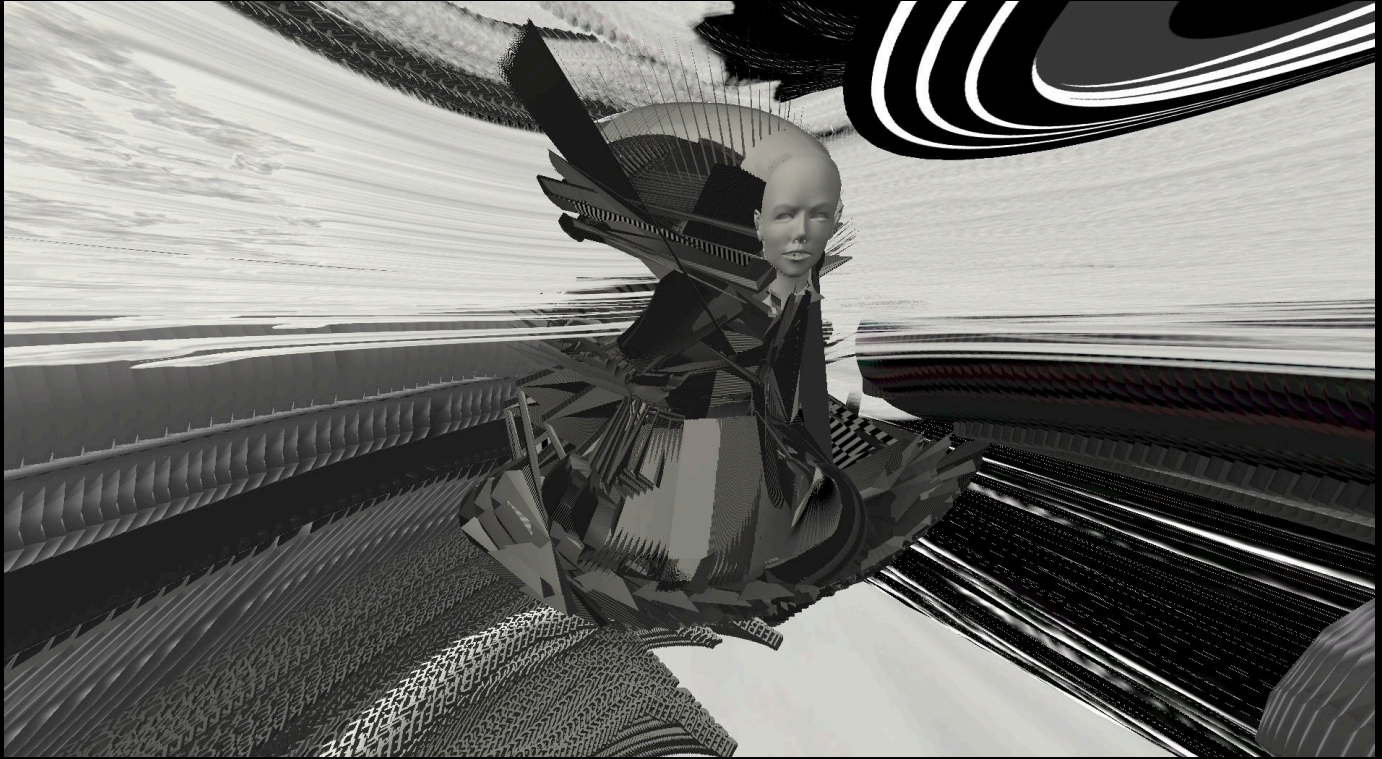
Like with Gannis’ AR filters, the solution will likely rest in a labor intensive migration to another platform. Software’s perpetual forward motion necessitates a paradigm shift in the maintenance of artworks. The companies that create the tools that inspire artists are not accountable to the artists, the tools will change, or even disappear, and the effort needed to prevent the artworks from disappearing is enormous.

²³ Deena Engel et al., “Caring for Software- and Computer-Based Art,” in *Conservation of Time-Based Media Art*, ed. Deena Engel and Joanna Phillips (Abingdon, Oxon: Routledge, 2023), 453-511, <https://doi.org/10.4324/9781003034865>.

²⁴ Ibid

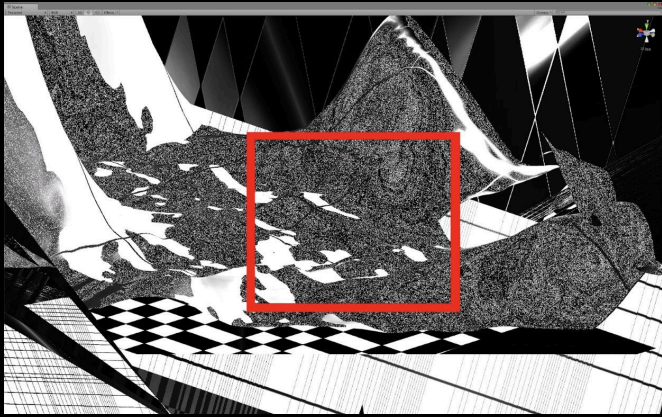
DCT:SYPHONING

by Rosa Menkman

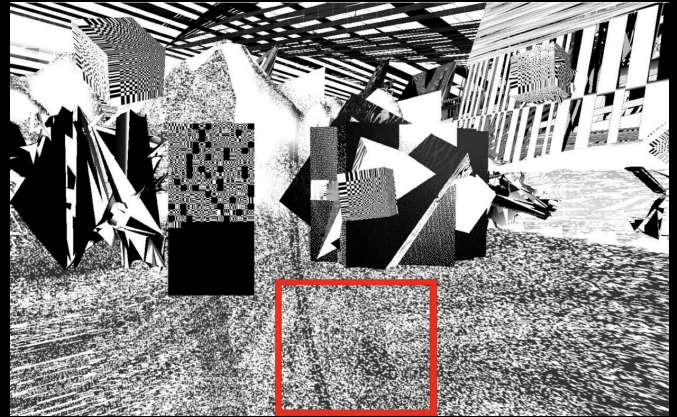


Rosa Menkman's *DCT:SYPHONING* (2016-2017) was built using the game engine Unity. Over the course of several years, Menkman developed a 3D environment of dizzying complexity articulating the implications of digital compression, specifically Discrete Cosine Transform (DCT). The work, steeped in the very technology the artist glitches to create it, is densely packed with meaning and theory, which Menkman also explores in her written work *DCT: The Guy Behind The Guy or: How Not to be Read (a recipe using Discrete Cosine*

Transform) (2015). Menkman navigates the 3D environment of *DCT:SYPHONING* in artist lectures and VJ performances and exhibits the work as a Virtual Reality (VR) environment, an installation, and a standalone VR app that can be downloaded from her website. In this way the work exists across several modalities and develops over time. Conservator Taylor Healy worked with Menkman to flush out the timeline of the work's varied career across these diverse modalities, and through that process, hone in on the work's identity.



Screenshot of *DCT:SYPHONING* in Unity 4.3.4f1



Screenshot of *DCT:SYPHONING* in DiMoDA version

While preparing for an exhibition of *DCT:SYPHONING* for *DiMoDA 2.0: Morphé Presence* at the Museum of Art Rhode Island School of Design (RISD Museum), Menkman noticed an undesirable change in the appearance of her work. When Unity updated from Unity version 4 to version 5, the developer completely overhauled the shaders and lighting.²⁵ The result of this update on Menkman's project was to lose detail and texture in aspects of her 3D environment.

To correct the shaders issue in the Unity project, a tedious process of rebuilding the Unity project in a contemporary system would be necessary. Since *DCT:SYPHONING*'s completion in the mid-2010s, Unity

has changed significantly. Their versioning system even changed, abandoning the numbered versions (1-5) and changing to a year-based numbering system (2019-2023), and then going back once more to Unity version 6 in 2024. Despite the platform offering a free "personal" license for individual use, and a substantial amount of installers for previous versions available online, Unity version 4 must still connect to the license server to activate.²⁶ The license server is obsolete, Unity now uses a different method for verifying licenses. The deprecated license activation system effectively makes installing Unity 4 and Unity 5 unfeasible. However, exports from any version of Unity are executables, standalone applications,

²⁵ Unity Technologies, "Upgrading from Unity 4.x to Unity 5.0: Shader Changes," Unity Manual, accessed December 11, 2025, <https://docs.unity3d.com/510/Documentation/Manual/UpgradeGuide5-Shaders.html>.

²⁶ simons_unity. "Early Unity Versions Downloads." Unity Discussions, August 2023. <https://discussions.unity.com/t/early-unity-versions-downloads/927331>.

meaning compiled versions of *DCT:SYPHONING* do not have a dependency on the Unity software itself.

The *DTC:SYPHONING* application, the compiled output from Unity, does have a dependency on x86 architecture and is not compatible with new ARM chip-based machines. While emulation of an x86 environment is possible, the substantial graphics and audio requirements of the application pose challenges to this strategy.

Moreover, Menkman has traditionally offered downloads of her interactive works from her website.²⁷ Ideally, anyone could download *DCT:SYPHONING* and experience it at home, without having to hassle with emulation or other complications. Coupled with the loss of detail in the shaders and the desire to maintain a contemporary OS compatible executable, a migration to contemporary Unity may be necessary.

²⁷ Rosa Menkman, "DCT:SYPHONING: The 1000000th (64th) interval," *Beyond Resolution*, 2017, accessed December 14, 2025, <https://beyondresolution.info/DCT-SYPHONING>.

The cycle of re-assessment

The rapidly evolving devices for extended reality (both AR and VR) and their often proprietary platforms offer inconsistent (at best) support for maintaining environments with non-compatible updates. The most robust process for maintaining virtual environments is one of perpetual maintenance and migration. For an individual artist like Menkman, the challenge of perpetually maintaining a work is enormous and nearly impossible due to proprietary software. The aesthetic changes apparent when migrating a work due to updates out of the artist's control are often too overwhelming and laborious to navigate and conservators are unable to make decisions about asset representation without artist input. The need for an artist's involvement in the preservation of their own work represents a paradigm shift in conservation pedagogy and practice, one that is taking place across all of contemporary art. Art conservator Gwynne Ryan describes the "increased need for collaboration and long-term relationship building with the artists" in her article "Variable materials, variable roles: The shifting skills required in contemporary art conservation":

"The role of the conservator as a participant in the realization of an artwork is often present to some degree with contemporary art through re-installation, re-enactment, and many times through replication of the artwork itself and ideally the boundaries of this role would be clearly established. However, these boundaries, more often than not, can become rather blurred, and require consistent re-assessment over time from artwork to artwork." ²⁸

The cycle of re-assessment, re-installment and replication of contemporary artworks underscores the work's connection to contemporary life. Huntrezz's masks exist in a constantly shifting landscape in a technology-mediated world, and therefore cannot exist in a static state. Contemporary art's responsive qualities are not limited to the digital landscape.

²⁸ Gwynne Ryan, "Variable Materials, Variable Roles: The Shifting Skills Required in Contemporary Art Conservation," in *Objects Specialty Group Postprints*, vol. 18, comp. Sanchita Balachandran, Christine Del Re, and Carolyn Riccardelli (Washington, DC: The American Institute for Conservation of Historic & Artistic Works, 2011), 105–112, <http://resources.culturalheritage.org/wp-content/uploads/sites/8/2015/02/osg018-10.pdf>.

When working with Janet Cardiff to preserve her video walk *The Telephone Call* in SFMOMA's collection (originally commissioned in 2001), the artist and her collaborators at the museum knew the work would have to change. The work, like many of Cardiff's "walks," requires the viewer to navigate physical space and experience recorded media in specific physical locations. Following SFMOMA's renovations, those physical spaces had changed, and so the walk would need to change as well. The necessity of "balancing between the needs of contemporary audiences and keeping the work as close to the original as possible" are reminiscent of the challenges the artists represented by TRANSFER face.²⁹ Just as *The Telephone Call* must adapt to the architectural change of SFMOMA's new building, the time-based media artworks by Gannis, Huntrezz, Menkman, Mills, and Papamargariti must adapt to technology's changing architecture in order to be able to be experienced. The "inherent challenges due to integral experiential aspects of the work that cannot be fully resolved without radical proposals of other presentation methods" demonstrates the need for time-based media conservators like arden, Healy, Kaplan, Roeck, and myself to work

directly with artists through initiatives like this one.³⁰

TRANSFER's "Trust Client" interface allows artists and conservators to create documentation and share information asynchronously, responding to the reality of both resource strain and evolving documentation over time. The self-hosted browser-based portal is backed by a customized metadata ontology that draws from the Linked Art Data Model, the PREMIS (Preservation Metadata: Implementation Strategies) data dictionary for preservation metadata, and time-based media conservation workflows. The interface structures this metadata in a customizable series of reports, covering granular information like individual components of a single exhibition, to broad concepts about the artwork's identity or conceptual origins. Rather than a series of emails, phone calls, and interviews resulting in a document the conservator has authored which the artist will never see, both parties can be working together towards a shared goal.

By moving into the artist's studio, and outside of the institutional setting of the museum, conservation and preservation better acknowledges the inherent mutable, flowing

²⁹ Karen Cheung, Joshua Churchill, and Shu-Wen Lin, "Repositioning Time and Memory: The Telephone Call by Janet Cardiff," VoCA Journal, March 13, 2024, <https://journal.voca.network/repositioning-time-and-memory/>.

³⁰ Ibid

state of variable media.

The role of the conservator meets the needs of a work in its lifecycle more closely than museums at large have enabled for these perpetually mutable works. Responsibility of the work's "life" has yet to begin its shift to another "parent." Nevertheless the skills and best practices developed by conservators in the museum can be leveraged to help these fragile and variable artworks "grow up" and remain active artworks which continue to perform throughout generations. Without intervention, many will face insurmountable obsolescence or ill-defined boundaries that let their identities slip away. To understand and protect these artworks calls for not only the conservator but for the artist's voice to be heard in their lifetime and much closer to the production of the artwork. Through mindful collaboration, cautious and managed change can maintain variable artworks and allow them to live long fruitful lives.

Upstream of Obsolescence

Learn more at transfer.art/trust

*Cover image: detail from Rosa Menkman's
DCT:SYPHONING (2016-2017)*

