

IPRES 2016
13TH INTERNATIONAL CONFERENCE ON
DIGITAL PRESERVATION
BERN // OCTOBER 3-6, 2016
OCTOBER 4, 9:00-10:00

Net-based and Networked
Challenges for the Conservation of Digital Art
Sabine Himmelsbach

Dear Ladies and Gentlemen, Dear Colleagues,

When the organizers of this conference on Digital Preservation invited me to share my experiences on the practical issues and challenges of collecting and preserving software-based art for museums, I was very pleased to accept this opportunity. I am speaking from my vantage point as curator and director of HeK, House of Electronic Arts Basel, an institution with a thematic focus that is unique in Switzerland. <IMAGE HeK> Founded in 2011, HeK soon began to assume the role of a national competence center for media art, covering the presentation, production, mediation and collection of works in this genre. In our programming and collection we focus on works that use digital technologies as a tool for production and that take advantage of the digital medium's inherent characteristics. We showcase artworks that reflect the input of media technologies on our society, that describe our current condition, in an age when digital processes are shaping our actions and inform our understanding of the world. Media art can take on numerous forms – from interactive installations to software, from virtual reality to locative media. It can be experienced in various forms of distribution – from displays within a museum, to displays on smartphones and tablets, or online.

The examples I will give today come from my curatorial background at HeK. I will focus on born-digital-art, and specifically on artworks that are net-based and networked. This means we no longer deal with a static object that can be “stabilized” in the classical sense, but rather with a boundless practice that is embedded in networked systems. These works – which use the Internet not as a tool but as an artistic medium – are challenging traditional notion of preservation. Traditionally, preservation means the fixation of a work, based on authenticity and integrity. But net-based and networked artworks are fluid by nature: They are as unstable as the networks in which they are embedded. They are beholden to industries, to a fast-changing technological environment and are limited by other parameters beyond the museum's reach. Conservation practices must acknowledge these performative and processual qualities.

Let me show you an example of such a net-based work that beautifully addresses this rootedness within the system of the global web. It is a work that has been shown in a group exhibition that HeK staged during the LISTE Art Fair in 2013. <IMAGE/CLIP LIALINA>

In Summer, created in 2013, net artist Olia Lialina, one of the Net Art pioneers of the 1990s, presents herself as an animated GIF model, riding on a swing against the backdrop of a dazzling summer sky. The GIF, a Graphics Interchange Format, is driven by the speed and quality of the network connection as the individual images of her animation are downloaded in real-time on various servers. The address bar, which remains

visible when the work is installed as a projection in a museum, connects to different addresses with each new frame, each featuring the extension /olia/summer. Thus the work is distributed across several websites, all hosting different interlinking frames. Lialina's work addresses the direct connection to its technological context. It's fully dependent on the Internet, using it as an artistic medium. The liveness and unstable condition becomes a significant property of the work.

Introduction

More and more Software-based artworks are entering museum collections, but as curator Christiane Paul points out, "for decades, the relationship between digital art and the mainstream art world and institutions has been notoriously uneasy." Joanna Philips, conservator at the Guggenheim Museum in New York, stated during the third Tech Focus Conference at the museum last year that the Guggenheim collection includes only 22 software-based artworks, which is the equivalent to 0.3% of the total collection. Nevertheless the institution is doing groundbreaking work with regard to digital preservation strategies.

"Software-based art is perceived as a risky area," says Pip Laurenson, Head of Collection Care Research at Tate. She supposes that the reason for the limited collecting activities in this area in museums is mainly due to the "lack of established documented practice for the conservation" of these works.

I think it is exactly this quality and expertise that give institutions like HeK their *raison d'être*, with their expertise in handling software-based art and their experience in meeting artists demands regarding technical infrastructure, equipment or maintenance.

Building up a collection of media arts and research addressing the 'digitality' of our society is part of HeK's agenda. The collection's main focus is on 'born-digital art' and specifically net-based artworks. Our collection is still in its infancy, but it is growing steadily and will have reached more than 40 works of software-based art by the end of 2016.

Of course, for such a small institution – no more than six people work fulltime at HeK – preservation is a tremendous task but nevertheless an important one. We involve many different experts in the management and monitoring process, in order to handle those complex and fluid artworks – from our technicians and those responsible for the information infrastructure of the institution, to the external expertise for inventory-taking. When the institution moved into a new building, it was not only the physical infrastructure that was newly built. We also redesigned our virtual information infrastructure so we could host and care for net-based artworks. These works are the focus of our collection at a time when few museums are collecting such works – one exception is the Art Base of the digital arts organization Rhizome, which is associated with the New Museum in New York.

Preserving those net-based artworks means preserving behaviors, not only artifacts. An enormous threat is technical obsolescence. In our world of rapidly changing technological formats there is no way of knowing how long hard- and software devices will remain functional, how long software-based tools will be supported or are downward compatible, for example. We are dependent on an industry that is based on and nourished by continuous change, promoting a new version and products in ever-shorter periods of time. For researcher Jon Ippolito, born-digital equals "born almost already obsolete" – or as science fiction writer and cyberspace theorist Bruce Sterling puts it: "The lifespan of many new media formats is closer to that of a hamster than of a human."

The last 15 years have seen many collaborative research groups and projects dealing with the issues of preserving media art. They have helped museums adapt to the idea that an artwork can no longer be presented with the original material or equipment.

The Variable Media Network at the Guggenheim Museum has done groundbreaking work with their focus on the idea of 'endurance by variability.' They set the standards for the four main approaches to preserving media art: storage or hardware preservation, emulation, migration and re-interpretation. One of their valuable outputs is the Variable Media Questionnaire, which today is used and promoted by the Forging the Future alliance.

Another project is Matters in Media Art. Collaborating towards the care of time-based media; a joint project by Tate, the San Francisco Museum of Modern Art, MoMA in New York and the New Art Trust. They provide helpful guidelines for the logistics of acquiring and lending media artworks. Many more could be named, and I am mentioning only one more example from Switzerland, Aktive Archive (active archives), a project initiated by the Bern University of the Arts that dates back to 2004 and focused on documentation, preservation and restoration as well as on storage of diverse forms of media art.

But the handling and preservation of net-based artworks is still a rather new field. HeK has been part of the tri-national research project Digital Art Conservation, lead by the ZKM | Center for Art and Media in Karlsruhe, with the only net-based project among the ten case studies that have been explored.

Case Study: Marc Lee, TV Bot 2.0

This case study, the work TV Bot 2.0 by the Swiss artist Marc Lee will be my next example. <IMAGE LEE 2.0> It is also one of the first works acquired for the collection. The preservation strategies involved were 'migration' and 're-interpretation.' In this case I would rather speak of 'versioning,' which is key to Marc Lee's artistic practice, as will be explained later.

The TV Bot by Marc Lee is an online news channel that automatically searches the most recent news items from the web and compiles and remixes these gleanings, be they from radio, television, newspaper, webcam or website news, into a continuous live stream. Searches include all languages, cultures or continents. The only relevant criteria are that the news must be not older than an hour. In its graphical design, the TV Bot mimics international news broadcasters like CNN or NTV. The TV Bot is 'born-digital art.' It runs on the Internet and takes its material from there, which means it is very much dependent on this rapidly changing technological infrastructure.

The TV Bot software is programmed with PHP and C++ script for Linux and scans the flow of information on the Web. The TV Bot software then indexes, analyzes and verifies the information. The sources are made visible to the users as URLs, time of discovery and the time code, when it has been updated. <IMAGE LEE 1.0>

The work originated in 2004 as TV Bot 1.0 and has been realized as a contribution to the online exhibition project 56k-bastard Channel TV by Reinhard Storz. Only six years later, the work was not functioning properly anymore. The standard of the World Wide Web to display audiovisual content had changed by then from the RealPlayer to the Adobe Flash Player.

Before continuing with the new version of the TV Bot, let me first show you a screen-cast fragment of the TV Bot 1.0 operating online from 2005. <CLIP LEE 1.0>

In connection with another online exhibition project with the title beam me up, Marc Lee migrated the work to the new web standard, but also renamed and versioned it as TV Bot 2.0 in 2010. TV Bot 1.0 only existed then as a historical Webcast-documentary from 2005. When migrating the work, Lee also made some esthetic changes and therefore also 're-interpreted' his own work. The presentation had been adapted to the new visual standards of news broadcasts. Also new was that the TV Bot was now accessing feeds from the community platform Twitter, which did not exist in 2004. The look and feel of TV Bot 2.0 is oriented to the older version, but – according to Lee – it was 'modernized' and updated to a more contemporary design. This included faster cuts in the changes from TV, radio or Webcam images, which are better adjusted to the contemporary flood of information. The whole presentation was arranged more clearly. Radio and TV broadcasts were labeled 'live' and a new logo – a spinning globe – was added.

To grasp these differences, we should look at a screen-cast of TV Bot 2.0 from 2011. <CLIP LEE 2.0>

When asked about the changes in the work, Lee would say: "For me it is still the same work. It had received a classical software update and a new branding." It is a good example of how artists often don't see their projects as static, but rather as constantly developing, based on the need to adapt to new systems. It also

shows that, for Lee, the code is not considered a key artistic medium but simply a means to enable certain functions.

When HeK acquired the work for its collection, the functionality of the software was guaranteed by the artist for another five years, but it was clear, that sooner or later another upgrade, as Lee calls it, would be necessary. Therefore, part of the acquisition has been a Webcast-documentary from 2011 from which you have seen an excerpt. Earlier this year, the TV Bot 2.0 went into 'defunct mode' as the Adobe Flash Player is no longer supported and the web standard changed to HTML5. Meanwhile Lee has released a new version – TV Bot 3.0.

I think this is a quite interesting case. This kind of 'versioning' or 're-interpretation' is key to the practice of Marc Lee. For the collecting institution it does not make sense to migrate the work, as the artist is doing this himself by interpreting and versioning it, but also by claiming it as a new version of the work. In my opinion, Lee uses this strategy out of necessity, as no one was ready to support him in preserving his work. In fact, there is a continuous double bind situation for such artists, partly due to media art not being market driven, and to the fact that collectors and institutions worry about how works can be preserved and therefore are not collecting them.

Mexican-Canadian artist Rafael Lozano-Hemmer pointed out the need for media artists to take action in preserving their own work so it does not "disappear from history" – even while recognizing that it is unfair that the artist himself has to deal with it. In his essay – or one could even call it a manifesto – on Best practices for conservation of media art from an artist's perspective he stresses the importance of being interested in both creating the work and "overseeing its death or zombification." With collecting these works, institutions also start a dialogue with the artists that document these decision making processes and changes that evolve over time.

But it is not only technological obsolescence that threatens such works. The versioning that Lee is applying to keep his work alive, also documents cultural changes. His work depends on newsfeeds that are freely accessible online. We are already experiencing today how more and more news portals use paywalls to regulate access to their data. In a couple of years the way in which we perceive news online might have changed. Many of Lee's works deal with the idea of the broadcast, a feature and inspiration from the era of TV that he incorporated into the new medium Internet. For today's millennials, television is no longer the influential medium that it was 15 years ago and in years to come a new audience needs to be familiarized with this specific TV esthetics that he is using in his work to understand the original cultural context. Cultural obsolescence is therefore another threat for such a 'living' and continuously changing work.

Case Study: My Boyfriend Came Back From The War. online since 1996

The question of cultural context is also addressed in my next case study. It's an example of how emulation strategies can be used to present an exhibition about Net Art, with works ranging from 1996 till today, in an emulated scenario, allowing audiences to perceive net-based works from the 1990s within their original technical constraints. <IMAGE EXHIBITION>

Earlier this year, from January 21st to March 13th, HeK staged the show My Boyfriend Came Back From The War. online since 1996, that was centered on the seminal work of the same name by the Russian net artist Olia Lialina and included remixes and responses to the work over the last 20 years. <IMAGE LIALINA> My Boyfriend Came Back From The War is a classic from the pioneer phase of so-called Net Art. Back when there was no general standard of access to the World Wide Web, artists already were using the global network as a new medium. Olia Lialina is among the first artists to explore the Internet's artistic possibilities. Her work broke new ground – both as Net Art and as an interactive narrative. It focuses on the story of two people who are trying to talk with each other about a war that has just ended. The work's historical significance lies in the formal aspects of the use of hypertext in a new form of narration, where the online user clicks through the story and plays an active role. But another central aspect of the work's effective power is in the universality of its story. And that is what has inspired artists for more than 20 years. Olia Lialina has collected 27 versions so far in what she calls the Last Real Net Art Museum, an online archive that has become a work in itself. <IMAGE EXHIBITION> The selection of 13 works, which were shown at the HeK,

reflects the development of the World Wide Web as medium and technology – from wondrous rarity then to omnipresence today. The various stages of the Internet's development are traced in the projects' structure and technical constitution: from HTML to Flash, Dotcom to e-commerce, from the website to the app. In order to do justice to the original 'look and feel' as experienced by the first users and also to illustrate the developments leading to today's ubiquitous Network – accessible everywhere through mobile devices – the works in the exhibition were presented on historical equipment. <IMAGE EXHIBITION>

Regarding the hardware, we are grateful to the Department of Conservation and Restoration of the Bern University of the Arts, which helped provide historical equipment. To create the sense of authenticity, we also needed to reproduce the historical conditions of the Internet. In the early days, it took a long time to load an image; a click did not bring you to a new frame within fractions of a second. Therefore all the historical works in the exhibition have been emulated. <IMAGE EXHIBITION>

For the emulation software that mimicked the Internet of the 1990s we owe our thanks to Dragan Espenschied, conservator for digital art at Rhizome in New York, as well as to the bwFLA, which stands for Functional Long-Term Archiving, a research team under Professor Klaus Rechert at the University of Freiburg, who did the groundwork for obtaining net-based art. Both of them will give presentations later today and will go into detail about how their Emulation as a Service approach can work for museums and other institutions in the future.

It was the software emulation that allowed visitors to the exhibition to appreciate the poetry of the historical works and intrinsic quality of the media as they have been perceived in their time. The tension and silences between the two protagonists in Lialina's story can only be experienced in the slowness of the connectivity of that time; the protagonists' waiting, their love and loss become apparent within the formal qualities of the work and part of its beauty is lost if experienced via our fast Internet connection of today.

The advantages of emulation are clear – it reaches across platforms and decades and gives artworks a context by simulating an original environment that would be otherwise lost.

To date, only a few museums have experimented with emulation. The Seeing Double exhibition at the Guggenheim Museum in New York in 2004 is one important example, the exhibition Digital Art Works. The Challenges of Conservation at the ZKM in Karlsruhe from 2011 showed examples and also the video games exhibition at MoMA in 2012 worked with emulation. The exhibition at HeK, thanks to the work of researchers from bwFLA in Freiburg and Dragan Espenschied, has been another interesting showcase to prove, that a whole exhibition setting could be created using an emulation framework specifically conceived for the demands of digital preservation. These projects help to show how preservation decisions and alterations change the esthetic of a work and how it is perceived by the public.

When we started to work on this exhibition, another institution in the Netherlands, MU in Eindhoven, showed interest in presenting the show as well, more or less within the same time frame. The artist then asked me if we would agree to that, which we willingly did. I think it shows clearly that within net-based practice, there is no original and it would have made no sense to claim that the works could only be shown at HeK.

Case Study: Beat Brogle, onewordmovie

My last case study focuses on a combined approach of migration and emulation to keep a work functioning online and to also preserve its historical authenticity. The Internet project onewordmovie by Beat Brogle and Philippe Zimmermann from 2003, an important example of net-based artistic practice in Switzerland from the early years of the 21st century, just recently entered the HeK collection. <IMAGE OWM>

onewordmovie is an online platform that organizes the flood of images on the Internet into an animated film based on user-supplied terms. A search for a particular word creates image results that are turned into a movie. Using a specially programmed search engine, users can call up images from the Internet that match their search term. The project's search engine is built on top of the most popular image search facilities available on the Internet – in this case Google. Supplied with a search term, the engine produces a 'hit list.' This list can be several thousand images long, depending on the term. The images on this 'hit list' provide the "raw material" for the movie. Following the ranking of the 'hit list,' the images are animated into a film in real-

time, following a fixed and predetermined score, which consists of a series of interwoven loops. Each film has an individual trailer displaying the search term as the title, and each film lasts until the 'raw material' is used up. Let me show you a screencast that has been produced in 2003 <CLIP OWM>. The last part of the videoclip with the search term Madonna is a good example to show how dependent the piece is on the cultural context of its time. The popularity of the singer and pop star Madonna in 2003 brought her image to the foreground in the clip we just saw. The search term 'Madonna' might bring a range of different images today.

And here some more examples for the search terms 'catastrophe' <IMAGE OWM>, 'chair' <IMAGE OWM>, 'holy' <IMAGE OWM>, 'fractal' <IMAGE OWM> or 'landscape' <IMAGE OWM>.

Beat Brogle and his collaborator, Philippe Zimmermann, had to make minor changes and upgrades every once in a while to keep onewordmovie functioning online, but it became more and more difficult for the artists to keep the project running on their own, especially when Google restricted the use of its API (Application Programming Interface) connections. In 2015, the artist contacted me at HeK and we started our dialogue regarding acquisition and preservation of the work.

The challenge for preservation is 'distributed obsolescence' due to the boundless or uncontained structure of the work, which uses technological infrastructure and data services of other big online companies that the artist does not control. The process of preservation started a month ago and is not completed yet. The strategy includes migration or reprogramming of the work and its parameters, for example changing the search engine to connect to Bing instead of Google, because Bing is still less restrictive in its use of APIs. The goal is to find a solution that would keep the work accessible online, keep the functionality intact, and simultaneously keep the historical esthetic of the piece intact. In these difficult tasks we are supported by the digital art conservator Dragan Espenschied, who helped us define the preservation scheme in close collaboration with the artists.

The PHP script that runs on the server can easily be preserved as PHP is a well-documented, open-source programming language under active development, but it depends on the availability and accessibility of the Google Image Search API, which creates the list of images based on the search terms. Already during recent years search requests have been placed through geographically diverse servers so that Google is not registering abusive use of the API and shutting down access. This of course can become even more restrictive and further diminish the list of found images for a particular search term. Therefore the preservation strategy also needs to deal with the fact that the Google search API might not be usable anymore within a couple of years.

So far, the use of onewordmovie has been documented but no image archive has been created. Here, Espenschied suggested an innovative approach. As soon as the work is functioning online again, the metadata of every search will be stored in a database. This enables the work to slowly transfer from a functional online work towards a work that is accessible online, but whose material when used for search requests comes from a database built upon earlier searches. This principle can be compared with the Rhizome project Webrecorder, a software used for web-archives that seems to be quite helpful for many net-based artworks.

The front end of onewordmovie will be emulated so that the original Shockwave programming remains intact. The whole process is repeated in collaboration with Klaus Rechert and his team from the Freiburg based research group bwFLA and their Emulation as a Service program.

We hope that this solution can also be used for other projects, because there are many net-based and networked artworks with similar properties and problems – like Marc Lee's 2014 work Pic-me, which combines photo and video messages from the Internet platform Instagram and connects them with related images from the Google Earth Browser. <IMAGE LEE> Lee takes advantage of Instagram's geo-tagging function, when it is not actively disabled by the user. In a live-stream that continues as long as people post photo and video messages on Instagram with the hashtag 'me,' one can see posts that consist of photos, profile images and the user's location in 3D animation, all of which can be zoomed in on. It's like taking a flight over the globe. <IMAGE LEE> What seems at first like a varied and volatile virtual journey across all

continents eventually is revealed to be a voyeuristic glimpse into the staged private lives of Instagram users, a glimpse that they themselves have granted to us voluntarily, in full awareness.

The life span of the 'original' version was only two years. Meanwhile, Marc Lee produced another version, as he already did for his work TV Bot. <IMAGE LEE> The second version of Pic me now works with the Google Earth App. Again he technically updated and modernized the design and versioned the work as Pic me. V 2. <IMAGE LEE>

Of course, ideally there would be solutions found in collaboration with Google and other web companies to support artistic practice and allow artists to use their web infrastructure – institutions like Rhizome in New York have made first steps in that direction and we are trying to initiate a dialogue as well.

Conclusion / Lessons Learned: From Closed to Open Institutions

The three case studies I presented exemplify that conservation of digital artworks needs to be done on an individual basis for any artwork. Although there is an understandable need for a bigger toolkit on well-established solutions to become more efficient in the future, these case studies help provide new insights into specific problems and challenges.

Needless to say, documentation plays a fundamental role in conveying the significant properties of a work and helping capture its stages and versions so that preservation decisions can be based on a firm understanding of the work, its functionality and its context.

Given the fluid characteristics of net-based and networked art, researcher Annet Dekker argues for a more speculative and process-driven preservation and speaks of 'authentic alliances.' She says, "By emphasizing 'alliances' I want to uncover the core of net art, which is not always immediately visible, and address its implications. ... What determines net art as authentic is found in relation to alliances. ... Net art is a process, where different properties of the work, authorship, and time are in alliance with each other. This doesn't mean that questions about material, author, and time are irrelevant, but there is a shift of focus to questions relating to ownership, authorship and copyright." I agree with her argument, that for a conservator – and also for other museum staff involved in preservation of works – this means "becoming part of a 'network of care' in which a collaborative approach is important to comprehend the complexities of networked art." Conservation thus "is less about conserving materials and more about the preservation of social information and relations."

Collaboration is essential for preserving net-based and networked art and must foster a dialogue between "those responsible for digital storage and information structure within the museum and those responsible for the digital collection," as Pip Laurenson claims. It also must involve a group of experts from different fields – within and outside the museum. Museums must find new ways to engage with communities that are already experienced in the field of preservation and that can offer support networks. Several articles and essays have already pointed out, that the preservation of software-based art can be advanced through interaction with gaming communities, which consist of amateurs who have preserved their own digital heritage by developing emulators so they can play their favorite old computer games. Dragan Espenschied mentions that "these communities have been tremendously successful in conserving aspects of digital culture that academia is still struggling to define."

Jon Ippolito supports "trusting amateurs with our future," as he titles one of his essays, and to shift the focus of preservation to practices outside the institution.

But even with these diverse collaborations we cannot avoid to engage intensively with the technology itself. Inspired by the conference Tech-Focus III. Caring for Software-based Art – an event hosted last year at the Guggenheim Museum in New York that included practical software exercise using basic technical aspects – HeK launched a series of events titled Conservation Piece(s), that aim to start a dialogue with specialists and experts from various fields, to collaboratively deal with the pressing issues of preserving media art. The first Conservation Piece was a conference under that name this past June, organized in partnership with Agathe Jarczyk, conservator of Modern Materials and Media at the Bern University of the Arts, and Dragan Espenschied, media artist, digital culture researcher and conservator. In organizing the first event of the ongoing series, we also emphasized a hands-on approach, to reach another level of engagement – to achieve

a deeper understanding for the technical aspects of media artworks and the computer languages and platforms they are rooted in. We hope we can foster a dialogue and help build regional and national knowledge communities here in Switzerland and also with international partners; to develop a “network of caretakers” or a “community of concern,” to cite again Conservation Piece symposium keynote speaker Annet Dekker.

We must change from closed institutions towards open ones that share information and interact with external communities in order to sustain a broad range of artworks. Establishing a dialog between all the players involved in presenting and preserving artworks will be a key factor, and I hope for many further exchanges from all involved parties. This is not an easy task, put a necessary one!

I started my presentation with my specific view and experience as a curator of media art. I would like to conclude with the importance of the role of the conservator within the broad network of collaborators, again quoting the artist Rafael Lozano-Hemmer from his essay Best practices for conservation of media art from an artist’s perspective. He writes: “Trust conservators! They are absolutely fundamental, if your work is to have a future performance. They also have a lot of experience in preserving the most diverse things 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.”

Thank you very much for your attention!