THE BLACK BOX BOOK

ARCHIVES AND CURATORSHIP IN THE AGE OF TRANSFORMATION OF ART INSTITUTIONS

JANA HORÁKOVÁ   MARIKA KUPKOVÁ   MONIKA SZŰCSOVÁ   EDS.

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Foreword

PANDEMIC

When reports began to emerge in early 2020 of the rapid spread of a highly contagious and highly unpredictable new type of coronavirus, the world froze in terror as images of the end of civilization surfaced in our anxious imaginations, images that emerged like memories of apocalyptic films that penetrated our attention through both old and new media. A global pandemic that spreads quickly over the world due to the heavy air traffic and the transportation of commodities worldwide has transpired as a threat to our enormously complex and consequently fragile globalized civilization.

The use of masks, later superseded by more effective respirators and limiting human interaction, were the main strategies employed to restrict the spread of coronavirus infection. Schools, theatres, cinemas, art galleries, sports venues, airports, hotels, bars, restaurants, and stores (apart from those selling gardening materials) were shut down or severely limited. These extraordinary circumstances have made possible the acceleration of digitalization and the shift to online in perhaps all areas. Teachers started offering lessons online. Restaurant menus were modified to accommodate delivery services. But what could artists and the cultural community as a whole do in such a situation?

Governments have attempted to preserve these severely pandemic-affected sectors through various financial support progams for promoting culture and the arts under these conditions. But can theatre be performed using Zoom? Can the art of dancing be disseminated on YouTube similarly to online yoga lessons for computer users looking to unwind? Is the presentation of artworks on Facebook or Instagram an alternative to visiting an exhibition venue, or does it instead degrade the event into an experience that oscillates between edutainment, charity fundraising for the impoverished, and an e-commerce platform? These

questions lead to not only the selection of acceptable communication channels, media, and media forms but also sentiments of absurdity and meaninglessness that can be read between the lines, as we all sense that these are attempts at the unattainable.

CURATING AS CARING

The curators of Galerie TIC, Katarína Hládeková, Zuzana Janečková and Marika Kupková, selected a different method. They chose to use the gallery operating funds, which could not be used for display projects owing to the pandemic, to support artists committed to investigating the current situation of the coronavirus pandemic and its effects on individuals and society. It was a kind gesture intended for artists whose careers were catching dust in galleries, art festivals, and art schools; a gesture of acknowledgement of creative involvement with the world as a comparable system to the natural and social sciences. It was one of the few, if not the only, activity geared at fostering artistic creativity and imagination during the epidemic, as opposed to maintaining the exhibition institution itself. They gave the profession of curating a new meaning: curating as the support of artists and the maintenance of art, not as a collection of objects for display, but as means of understanding the world.

The curators issued a call for submissions on the gallery's website on March 27, 2020, with only very general guidelines. Indeed, the primary objective was to encourage artists to work and convey the message that society needs their work, to help us identify with their statements, to connect, to share feelings and impressions, personal experiences of anxiety and fear for loved ones; but also the desire to help, in short, to express everything that the leaky grids of statistical tables (of numbers infected, tested, vaccinated, and dead) filled with anonymized and abstract data can never capture. The activity and impassioned commitment to art creation by the gallery's representatives during the epidemic were eventually extended to other issues. Due to Marika Kupková and Jana Horáková's personal ties, it was decided to continue the project to explore together the curatorial opportunities in the online network structure and digital environment, not as a replacement for gallery institutions but rather as a medium in and of itself (in the sense of the specific matrix of digital and the peculiar communication environment of the www). We decided to make The Black Box available online as a digital archive with access to other works, various curatorial interventions, and their documentation rather than as an exhibition project. The interconnection with the research and application project centred on the experimental use of artificial intelligence for processing the artwork archive-inspired the basic structure of the online presentation, which consists of two complementing components: Only the Artists Survive (Jen umělci přežijí) features documentation of initiatives chosen by the curators of Galerie TIC; and the section entitled New Archivist (Nový archivář), which contains documentation of art projects augmented by other personal testimonies

and traces of the pandemic that the artists were requested to provide, and the resulting database of artistic and non-artistic images and records that were experimentally processed by artificial intelligence using the unsupervised learning method.

CURATING ONLINE

The support of the Czech Republic's Ministry of Culture and the Czech Republic's Technology Agency enabled us not only to create the online archive/curatorial project The Black Box but also to develop it into a platform for sharing experiences in overcoming the limitations of anti-epidemic measures by art institutions and festivals. We have also broadened the scope of online curation to encompass the contemporary issue of employing artificial intelligence in the processing of digital art databases. Monika Szűcsová, the third member of the writers' collective, joined the tandem then and oversaw the organization of three Curating Online symposia in 2021 that focused on galleries and festivals in the epidemic era and the application of artificial intelligence to online curating practice. Black Box gradually grew to encompass other activities and took on the features of a more extensive research and application project.

The discussion later grew to include theoretical deliberation, sharing actual case studies from domestic and foreign art institutions' work in the epidemic period, and online curating in general, including the application of artificial intelligence when working with substantial digital art collections. These efforts culminated in The Black Box Book, which also carried them on in the form of (online) publication.

THE BLACK BOX – PRESENTATION

The Black Box project went online in September 2020, and since then, it has been presented several times, both online and offline, or was reported on in the form of conference papers. The Black Box was first presented to the public at the Ars Electronica festival (9 September – 12 September 2020) (1), which took place partly online and partly in the public space of Linz and in other cities around the world, from which festival participants joined the collaborative online program with live and pre-recorded contributions. It was subsequently presented in the form of a conference paper at the HUMAIN conference (19 September 2020) (2) and was brought into the physical space of Industra gallery as part of the accompanying exhibition of the same event, where visitors could enter a 3D black box resembling a pop-up screening room. Inside of it, the artists' works were displayed to the audience as a slide show; the creation of artificial neural networks was presented through an educational video (3) that captured the process of decomposing an image and its analysis by intelligent software. A curatorial experiment with the method of "unsupervised learning," the New Archivist section of the Black Box website, and

the insights gained from this experiment were presented at the international conference hosted by the Vienna-based organizers, Ra/Upture: Xenofuturities Specters Anachrony (October 3 – 4, 2020). (4) The AI curator was also presented at the EUNIC AI Science Café Series: AI & Art (12 May 2021), organized by Czech Center London. (5) The curatorial concept applied in the Black Box project was shared with the participants of the Signal Talks symposium with the subheading PLAN C: Sustainability of Cultural and Artistic Environments (15 October 2021). (6) The project was also developed as a contribution to the HUMAIN conference proceedings (published in 2021).(7)

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INTRODUCTION

JANA HORÁKOVÁ

"Does it make sense to theorize the present when it seems to be changing so fast?" (Manovich, 2001, p. 34)

This publication represents one of the first attempts to analyze and reflect on the extraordinary period of the global Covid-19 pandemic, whose impact on the art world can be regarded as a shock that requires reflection as a condition for the conscious integration of this experience along with some crisis solutions into the curatorial practice of the post-pandemic era. In this book, a group of authors maps and critically examines the transformation of exhibition strategies of memory institutions and galleries. Thus, it focuses on the period around 2020 and the implementation of anti-pandemic measures to prevent the spread of Covid-19. During this period, there was a general shift towards the use of online communication platforms for art presentation, which, in conjunction with the long-term process of digitization of art collections and the development of art practice and culture using digital media, led to the testing of new curatorial approaches, often in a confrontation between the gallery practice of brick-and-mortar exhibition spaces and the online curatorial projects that were in development up to that time.

During the quarantine, the internet environment was utilized to an unprecedented degree to display not only digital art but also the operations of traditional art institutions that were forced to transfer online. The World Wide Web and digital media were thus thrust into the spotlight overnight, drawing the attention of art world actors, art consumers, and the general public. As a result, traditional brick-and-mortar galleries and experimental digital art endeavours met in a common virtual space. For the first time, their curatorial projects were exhibited in a setting that ensured a level playing field for all participants. This gave a unique chance to examine the parallels, contrasts, and complementarities of online curating and offline exhibiting techniques brought online.

This publication captures and reflects on these encounters. The authors argue that the transition from the physical to the online world is not merely a translation or simulation of a physical gallery space but that online curating and creative practice in the digital media environment represents a distinct, evolving, and media-specific practice that has been establishing itself as a distinct discipline for many years. In the realm of digital curation, the authors of this publication have added cases of the application of artificial intelligence (machine learning) in the processing of digitized art collections in the position of curator. In fact, the experimental use of this new technology in online curatorial practice coincides with the pandemic and is consequently one of the defining characteristics of this period.

As we have observed, no one has yet devoted a monograph to a systematic description and assessment of the transformation of the art world during the Covid-19 pandemic. During this time, a myriad of texts with a journalistic tenor explored topics such as art education online (Hládeková, 2020) or the crisis of art and the status of the artist during the general mobilization to fight the pandemic (Jakalová, 2020), or the nature of the disease or of viruses in art. (Dumitriu, 2020) It is only in recent months that scholarly studies devoted to the state of art practice and artists in the pandemic era have begun to appear, yet the issue orbiting around the transformation of curatorial practice has not appeared in the form of an independent monograph. A remarkable reflection on contemporary Czech art, including the pandemic experience, was made by Václav Magid in his contribution to the publication *Jinde a Jindy* (Elsewhere and at Other Time) in which he primarily traced the relations of the artistic field to the phenomenon of the present and the risks associated with an era dominated by a politics of identity. (Magid, 2021)

A short note on the massive transformation of curatorial work from traditional art institutions to the web due to global pandemics is offered in *The Broken Timeline* (Dekker, 2021). It is reflected more narrowly in selected chapters of the book Barranha, H. & Henriques, J. S. (eds.) (2021). Among the studies that are to be found on the EBSCO database, the closest to our point of view is the study (Maciuk, K. & Jakubiak, M. & Sylaiou, S. & Falk, J. H., 2022), in which the authors published data on the attendance of online activities of surveyed museum institutions and framed the interpretation of these figures with commentary on the tools chosen and the ability of the staff of these institutions to use

them creatively. The study (Naef, P. & Birchler, B., 2022) provides insights into the impact of the pandemic on performance art and artists in France. An article (Zoljargal, 2022) focuses on using marketing skills by artists who have had to adapt quickly to anti-pandemic measures. One study (American Journal of Arts Management, 2022) is centred around the issue of online broadcast performances in terms of audience satisfaction. Elena Sidorova presents the economic impact of the pandemic on the art market in her study. (Sidorova, 2022)[1]

This publication is one of the first glimmers of reflection concerning online exhibition practice in the age of the pandemic, and the research cited above corroborates it to some extent. Yet, these previous reflections do not overlap with the topics addressed in this book. It should be noted that the issues of digital curation and digital art preservation have been the subject of a long-standing debate from which our research team has benefited.[2] While making contributions with research inquiries centred on internet curation during the exceptional pandemic period and introducing artificial intelligence as a new force of curation online.

This monograph tries to answer the question of how curatorial techniques, communication platforms, and the social role of exhibition institutions have altered due to rapid and external circumstances, which at the time of the Covid-19 pandemic compelled the shift from physical gallery spaces to online environment. To achieve this set of objectives, a combination of methodological approaches is used, navigating between the inductive and deductive treatment of the issue, to provide the most comprehensive picture of the lived practice of digital curation in the time of the pandemic, accompanied by expert commentary and dialogue with relevant academic discourse. From the online curatorial discussion standpoint and the problems with archiving and mediation of digital art, case studies of particular online curatorial projects incorporating digital media are framed and analyzed. Members of the author collective frequently describe projects in which they have participated, imbuing the studies with a flavour of personal testimony and providing not only detailed descriptions of the projects' outcomes, but also conceptual context and unique information about the specific circumstances of their work. The authors consistently contextualize particular investigations into the growing topology of online curation within the broader theoretical discourse and view them in connection to other similar curatorial attempts.

The first chapter, *Digital Curating and AI Curating: The Network of Terms,* focuses on the basic concepts used in the book and forms the methodological framework of the book. It begins by introducing the phenomena of the widespread digitization of cultural material and

1   The EBSCO scholarly database was used to search for studies: https://www.ebsco.com/ (Accessed December 23, 2022).

2   See the chapter Digital curating and AI curating: The Network of Terms dedicated to the terminology used and lists of references used in writing each chapter of the book.

the issue of the increasing number of 'born digital' artefacts and cultural projects requiring specific preservation and mediation solutions for the future generation. Digital Curating is elaborated upon to describe the new phenomena of employing Artificial Intelligence (AI) to interact with digital traditional art collections and expand AI Curating methodologies.

The following chapters are organized into three sections. The first section is *The Black Box: The lock-down curatorial project*. In each chapter, the authors discuss the online curatorial project **Black Box**, which was the primary impetus for the writing of this book that provides different perspectives of the roles played by the creative team members in the process of the project's realization.

Chapter *What to look for in a black box? An attempt to recapitulate the pandemic experience in gallery management* places the project in a broader context of the conditions of exhibition institutions in the Czech Republic at a time of repeated lockdowns. It outlines exhibition and dramaturgical trends that dominated Czech galleries in the 1990s, the period preceding the pandemic outbreak. These include reinforcing the idea that the gallery serves as a critical institution that hosts and nurtures social engagement. These ethical arguments affected Galerie TIC's response to the operational restrictions and existential uncertainties brought on by the outbreak and lockdown. Therefore, the birth of the **Black Box** project is not merely a result of the decision-making of a particular curatorial team but also of broader institutional strategies and progressive art management practices. The key terms that emerge in the process of reflecting on the transformation of art institutions in the first year of the pandemic are words such as 'paralysis', 'partial decline' or the 'mechanical conversion' of an off-line program to online, followed by a reflection on the impact that these categories have bore upon art management. The theoretical background within which the chapter operates frames the (re)established practice of exhibition institutions to use already proven or test new curatorial strategies in the environment of the world wide web as a space that transforms the categories of art, institution, authorship, audience or curatorial practice. The chapter recapitulates the reasons and problems curators faced in seeking ways to meaningfully run an institution during the exhibitions' closure and imposed isolation. It describes how the gallery has morphed from the expected role of displaying and mediating the experience of art to one where it becomes a co-producer or a general supporter of artistic production. Namely, this support included, above all, the provisioning of creative scholarships or long-term support for contemporary artists. This text interprets various artistic interventions that became part of the **Black Box** project, also in the wake of the lived realities of a fomenting health and economic crisis. In conclusion, the chapter summarizes the position that the project occupies in the context of a critical reflection on the contemporary state of (not only local) artistic and cultural production, understanding it as a project situated at the intersection between an archive, a curatorial experiment and an online gallery of artworks.

Chapter *A New Archivist* describes the intervention of an inhuman curator in a collection of art projects inspired by the lockdown era. The inhuman curator, represented by an AI algorithm, was trained by an unsupervised learning model to situate the curatorial project as a post-apocalyptic narrative about the extinction of humanity, where the remaining artefact of a black box contains artistic reflections concerning the experience of the pandemic. The three phases of AI experimentation are described in detail, whereby the aim was to coax the software into playing the role of an alien, attempting in its manner to decipher the communication code and understand the message of the box's contents.

The Chapter *Web Is the Key*: *On the Design of the Black Box* gives insight into the work of a graphic designer and web programmer. It describes the conceptual background and inspirational sources for web design, emphasising on the complementary relationship or inseparable link between graphic elements and functional features of the web. Finally, it explains how the ideas of artificial intelligence (unsupervised learning) have been woven into the website's operation.

Section *Curating online (2020)* discusses the issue of curatorial practices in the online environment, underlining the unfolding events in 2020, marked by the lockdown and the associated exodus from brick-and-mortar galleries to online spaces. Responding to this circumstance, internet curation fought traditional exhibition institutions for the first time, establishing itself as a distinct discipline and developing its tactics in parallel with the functioning of brick-and-mortar galleries for many years.

The opening chapter of this section, entitled *2020: Is It the End of Curating on the Web?* by Marialaura Ghidini, traces the evolution of digital curating in terms of the changes and trends it traces from 2009 to 2020. Respectively, the author underscores how the year 2020, or the lockdown period in general, is a critical turning point in the discipline's evolution. These seemingly favourable conditions nourished the role of digital curating, which in turn has paradoxically led to its decontextualization. More specifically, drawing attention to the reality of online curatorial projects moving away from site-specific and infrastructure-specific strategies. Online-migrating galleries were just relocating exhibitions from offline to online without regard to the changed context, which generated tentative or fuzzy results. To articulate this problem, the author introduces the terminological distinction of "curating on the web" vs. "curating online," which enables her to pinpoint the fundamental differences with respect to these approaches and their use of online platforms as vehicles for exhibitions. According to Ghidini, curating on the web is a subset of online curation, with the former referring to a range of practices from a site-specific approach to curating web-based exhibitions, as opposed to an approach based on re-formatting existing material to be viewed online, such as displaying documentation of artworks or displaying digitized art collections online. It provides a reflective consideration of the site-specific elements of the online environment as a crucial feature of digital curation (aka curating on the web).

The juxtaposition of digital curatorial projects with the provisional use of online platforms by traditional exhibition institutions with no prior experience with online curation also serves as the argumentative thread of Gaia Tedone's following chapter, *2020 Digital Odyssey: Online or Nothing*. The author works with the notion of the "curatorial digital divide" (an appropriation of Claire Bishop's 2012 notion of the digital divide) to articulate the new conditions of online curating that emerged due to the pandemic. At this time, to maintain a dialogue and relation with their audiences, previously web-resistant or conventional institutions shifted towards a massive online presence without the implementation of online curatorial practices they had established over the years. This situation may have been a chance to abolish the difference between online and offline curation, yet the opposite proved true. As a result, many internet-specialized galleries and artists resisted this, and some even temporarily suspended their online curatorial operations. Moreover, the proliferation of exclusively online art projects during the pandemic has made visible another pressing problem of digital art, which is the absence of a policy for archiving online cultural and artistic production, which, however, has yet to be discussed and taken into account in the practice of memory institutions. In the conclusion of the study, Tedone uses examples of good practice to demonstrate how the "curatorial digital divide" can be bridged by cultivating a dialogue between the two camps with projects based on "networked co-curation" (Tedone) through productive collaboration results in mutual enrichment of knowledge and experience, as well as the emergence of new curatorial formats.

The chapter *Networked Art Practice After Digital Preservation* discusses the preservation of networked art practices, such as pre-internet mail art or born-digital software-based or net art, from the last sixty years. Sarah Cook and Roddy Hunter endeavour to answer the question of appropriate strategies for their preservation in light of their specific materiality. The authors observe, along with the so-called dematerialization of the art object, the material features and ideological dimensions of these works have challenged existing approaches, methods and protocols of art conservation. They find appropriate strategies for preserving these artworks in the context of performance art, for instance, in the form of re-enactments. In addition, Internet archiving technologies such as the Internet Archive's Wayback Machine indicate a shift in preservation tactics and the concept of artistic creation, authorship, and curatorial agency. This chapter contributes to current research that traces the margins and limits of networked art practice following digital preservation.

Michal Klodner's chapter, *Ecosystems and Artistic Research in Forming Digital Curatorial Infrastructures*, expands on the preceding chapter with his observations on proper preservation solutions for digital art and online art initiatives. He advocates for media art preservation strategies that approach these works as open cybernetic systems involving social actors or living ecosystems, which means that the preservation of these

works cannot be limited to the preservation of the work's material aspects in the sense of obsolete technology. The author also emphasizes the issue of the isolation of online archives and museum collection portals, both in connection to the general public and between themselves. In this regard, he is convinced that the ideas of social networking must be integrated into the archival practice of digital art. Accordingly, digital curation and preservation tools should encourage critical reading, qualitative approaches, paratextual apparatus, and broad performative interaction and conversation as guiding principles for cultural platforms. Moreover, the author does not address the question of an appropriate and optimally functioning technical infrastructure of online archives in isolation but rather in the context of an ecological discussion, understanding media ecology as a condition and accompanying phenomenon of natural ecology.

Section *AI Curating* is dedicated to artificial intelligence (machine learning) as a new phenomenon in the field of digital curating. AI is presented through its applications in the field of art, ranging from the generation of images based on pattern recognition in databases of human creations to AI as a curator of extensive digital collections of antiquated art. Furnished with the capabilities of accelerating and extending human abilities to work with big data in art history, we can understand AI as a new player in contemporary digital curating. Also, AI is discussed as an object of artistic research, critically reflecting on AI's social and epistemological function. The novelty of this issue has influenced the character of the majority of contributions in this section, which tend to focus on detailing specific projects rather than offering cursory observations on the topic.

The author of the chapter *On Computer Creativity. Machine Learning and the Arts of Artificial Intelligences* describes how artificial intelligence works in generative arts. Andreas Sudmann contends that AI systems serve as assistants for people rather than taking the lead in the creative process. He argues that human involvement in these AI processes is always significant in all phases of development, from the collection of learning data, construction of models, and the fine-tuning of algorithms that are the basis for training the models. It also critically examines the criteria used to evaluate AI creativity and challenges why we typically settle for an AI model's capacity to imitate human creativity. Central to his argument is defining and redefining creativity and art in relation to AI-generated works. Here, a space is opened for discussion about computer creativity that should also challenge us to take the contradictions of human creativity and art production seriously. In light of the always-changing dynamics of artistic production and creativity within the contexts of industrial and post-industrial societies, he asks how machine-like or how dissimilar human art and creativity are from AI.

Lukáš Pilka recounts his personal initiative, in which he deployed AI (machine learning) as a curator of digitized collections of antiquated art in a network of Central European memory institutions, in the chapter *Digital Curator in the Museum of Fine Arts*. The AI tools he created for this aim were used to look for works based on artistic techniques, sym-

bols and taste. Users can curate their selections from the database using the **Digital Curator**, a customized website he developed based on recurrent motifs characteristic of a particular period in art. The intention was to respond to concerns raised by AI research on knowledge extraction from art collection databases, where software developed for the visuality of contemporary popular culture is frequently used to analyze works from earlier historical periods. To verify that the AI does not, for instance, confuse a halo with a hat or identify an angel in a painting, Pilka's team manually edited the dataset that has been given the proper metadata.

Similarly, the chapter *The Next Biennial Should Be Curated by a Machine* details a specific curatorial effort that infuses AI into the creative process in the capacity of an exhibition curator. The creators of this AI software, UBERMORGEN, explain how this tool was utilized to create the exhibition concept after the AI was taught the know-how of the curators of the Liverpool Biennial shows. In addition to placing AI in the place of the object described in this chapter, the author also incorporates AI into the translation and editing of text by using AI tools. As a result, the chapter's reader gains a quick understanding of the kinds of effects that the collaboration between humans and AI can produce.

AI: All Idiots is the title of the final chapter in the section dedicated to AI curating. Here, Barbora Trnková describes the collective exhibition of the same name, whose creators critically tested various facets and phases of the machine learning process: from manipulation of input data during dataset processing to the biases introduced in the process of automated cognition and the technical limitations of the tool itself. It challenges the premise that AI is incapable of providing novel creative solutions and draws out the tension between creativity and the perpetuation of the status quo. The artworks on display serve as both testament to the conflict between human artists and the AI tools' machine logic and further as evidence that creative AI research has the potential to be a distinctive type of critical reflection addressing this unravelling medium.

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CHAPTER 1

DIGITAL CURATING AND AI CURATING: THE NETWORK OF TEAMS

JANA HORÁKOVÁ
MONIKA SZŰCSOVÁ

This chapter contains a selection of concepts crucial for understanding the conceptual and theoretical background of contemporary curatorial practice conducted online, with a sensitivity to the specificities of digital and networked media (Digital Curating). In turn, it serves as a basis for theoretical reflection on using artificial intelligence (machine learning) in curatorial projects focused on processing digitized art collections or experimenting with AI as a new medium in digital art (AI Curating). This chapter aims to provide a basic understanding of the current discussion on digital media curation by defining the terms used in this publication.

DIGITIZATION OF CULTURAL HERITAGE

The digitization of art collections of major memory institutions has cultivated the conditions for dynamic changes in archival and museum practice, whether it is the online accessibility of collections or the creation of tools for interaction with their content in the form of curatorial interventions, educational programs and playful mobile applications. This has resulted in narrowing the gap between the modes of reception of pop-culture production and so-called high art in the interdisciplinary context of the internet. For example, in 2011, the **Arts & Culture** portal was launched as part of the Google Art project in collaboration with 17 international partners, including Prague's Museum Kampa. Currently, the platform hosts the digitized archives and depositories of approximately 1,200 museums and galleries. Another similar project is **Europeana**, the European Union's portal launched in 2009, which makes available the digitized content of 3 000 museums, amounting to 10 million artefacts.

DIGITAL ART AS PART OF CULTURAL HERITAGE
The digital revolution has not only affected the practices of memory institutions concerned with cultural heritage in the form of traditional artistic media. The digitization of contemporary culture and the emergence of digital art have brought many more dramatic changes to the practice of archives, museums, and galleries.

> *"Digital technology has introduced new multifarious ways of expression that change the nature of the object to be collected, as well as changing the expressive methods available for displaying and archiving collections. These new objects and the techniques used to preserve and interpret them embrace interactivity, make use of linear and non-linear structures equally, and encourage new methods and ever deepening degree of participation."* (Grau (ed.), 2017, p. 9)

In 2004, Oliver Grau initiated the Media Art Needs Global Networked Organisation & Support declaration, which warned of the imminent loss of many digital artworks created in the preceding decades and urged the protection of this art as an intrinsic component of cultural heritage. The publication of the declaration, signed by dozens of interested parties,

was followed by a professional discussion on the subject, supported by the organization of a series of **Media Art History** conferences held since 2004. Currently, the topic of archiving, preservation, and mediation of digital art is being addressed by several researchers and archivists in many countries worldwide. It has become one of the leading research directions of digital art as an academic discipline. There is also a growing network of memory institutions specializing exclusively in digital art, many of which also maintain online, freely accessible databases of these works. For example **Rhizome; compArt daDA: the database Digital Art; ADA, Archive of Digital Art; Runme.org; LIMA; EAI. Electronic Arts Intermix; ZKM. Center for Art and Media** and others.

The current debate has changed from arguing for the importance of archiving digital art to the question of how to accomplish it, to which there is no clear solution. This is due to the performative, unstable nature of digital art and the emphasis placed by artists on needed critical reflection concerning the specificity of the digital medium. Moreover, the role of its distinctive materiality and the cultural-political framework of its creation and operation necessitates the inclusion of a broader context in consideration of archiving and mediation of the work for future generations. While the performative nature of digital art calls for the application of methods used for the preservation of live art, the collaborative and participatory nature of many net artworks is reflected in curatorial strategies based on community collaboration, and referred to as a 'network of care' (Dekker, 2018). However, the specific materiality of digital media reflecting works such as software art, code works, or robotic art calls for essentially traditional preservation approaches, albeit applied to software art. Another open problem specific to the archiving of digital art is that of sustainability, viewed from the environmental impact of the production of extensive digital data collections, which poses a question of curatorial choice for archivists. This has been addressed initially by the implementation team of the ADA online archive, for example, using a method of collaborative archiving based on the characteristic features of Web 2.0 and 3.0 (Grau & Coones, 2018).

DIGITAL CURATING

The discourse surrounding the curation of contemporary media art is strongly shaped by the environment in which it is realized (digital network environment) and the artistic medium (digital technologies). The environment and medium largely determine thinking not only about the production but also the distribution and presentation of art, as a curatorial practice is closely linked to technological and social and cultural developments. From this environment, represented by artists, theorists, and curators, the conceptual field that defines the discourse emerged in the thinking about strategies and methods of mediating digital art.

CURATORIAL DIGITAL DIVIDE

Gaia Tedone (2019, 2020) situates the term 'digital divide' (which in the context of the social sciences signifies unequal access to technologies and network infrastructures, and which art critic Claire Bishop (2012) borrowed to think about the relationship between new technologies and contemporary art, understanding new media as a subfield of contemporary art, albeit with its discourse and network of distribution) in the milieu of curatorial practice. (Tedone, 2019) She asserts that the 'digital divide' contributes to the polarization of the position of new media art curators and contemporary art curators. The digital divide of curatorial practice, Tedone argues, is both a condition and a response to many factors:

> *"First, the networked infrastructure and level of digital literacy which curators rely upon and have access to when conducting their projects and activities. Second, the different theoretical references and historical genealogies that make up the fields' intellectual discourses. Third, the different market dynamics which have an impact on the circulation of artworks and their sales, as well as the employability of curators inside both the academic and the museums' sectors."* (Tedone, 2020)

NETWORKED CO-CURATION

Developments in the practice of collective and network curating have contributed to a shift of the curatorial agency from online curation to 'networked co-curation.' (Dekker, ed., 2021). At the time when an enormous variability of constellations formed by *"a collision of different interests driven by economic, cultural, and socio-political agendas"* and the emergence of new relations consisting of *"human and machinic agents, objects and practices, [...] a curator needs to take into account a complex interrelated network of dependencies and contexts that are often invisible or incomprehensible to most people. In such a scenario online curation becomes 'networked co-curation' and shifts the attention from 'what' is produced to 'how' it is performed under the socio-technical conditions and relations that characterize the current state of the Web".* (Dekker & Tedone, 2019)

Tedone refers to 'networked co-curation'[1] as a distributed, decentralized, collaborative, networked, and performative process and practice of online curation and provides some examples of such practice. She mentions the work by artist Arthur Jafa, **Love is the message, the message is death** (2016), or the online project curated by Zhang Ga, **We=Link: Ten Easy Pieces** (2020). (Tedone, in her chapter of this publication) To underline the shift in attention of the networked co-curation *"from 'what' is produced and exhibited to 'how' it is performed",* Dekker and Tedone (2019) analyze the curatorial and artistic projects **#exstrange: a curatorial intervention on eBay** (where curators Marialaura Ghidini and Rebekah Modrak appropriated in 2017 the commercial, auction-based platform eBay) and Harm van den Dorpel's **DeliNear.Info** (2014), an experimental space situated in-between 'a sketchbook, a social platform, and an archive' (Dekker 2015). While curatorial activity within the framework of networked co-curation heavily relies on digital tools and networked infrastructure, both projects represent *"forms of creativity that emerge as the result of unpredicted encounters on online platforms [and] show how online curation is performed 'in' and 'through' human and technical objects, relations and interactions".* (Dekker & Tedone, 2019) As a critical 'operational strategy' and 'theoretical concept', networked co-curation could be well suited to *"become a method for producing cultural differentiation and valorization under the current state of privatization, corporatization and commodification of the Web".* (Dekker & Tedone, 2019)

CURATING ONLINE/CURATING ON THE WEB

Marialaura Ghidini distinguishes between the terms 'curating online' and 'curating on the web' (2019), considering 'curating on the web' as a subset of 'curating online' in that she understands 'curating on the web' as a site-specific approach, for exhibitions realized in a web-based environment. Namely, this perspective enables new ways of producing and displaying digital art. Also, according to Ghidini, *"'curating on the web' is, at its core, responding to the characteristics of the web medium, its tools and interfaces".* (Ghidini, 2019) Ghidini (2019) believes that the testing of the networked environment and its research has enabled the emergence of online spaces for the mediation of artworks: *"with the mass use of the web, exhibitions have evolved from spaces displaying web-specific art to platforms that nurture its production and different ways of engaging audiences"* (Ghidini, 2019, p. 4) Concerning this situation, she finds it beneficial in the process of 'curating on the web' to think of the platform as an open-ended and grass-roots process rather than a set of objects and a space that *"focuses on a certain kind of cultural practice".* (Goriunova, 2012)

1   Further analysis of the term available in Tedone, G. (2019). *Curating The Networked Image: Circulation, Commodification, Computation.* PhD Diss. London South Bank University.

Ghidini (2019) relates the curatorial approach of 'curating online' to the practice that derives from the online display of museum and gallery collections. She initially defined this method through The Smithsonian Institution's experimental approach to the **Revealing Things** project (1998) to the **Google Arts and Culture** project (2011-present). It also analyses several examples from the history of 'curating online' practice, based on how they have responded in a site-specific way to the changes that web technology has brought to publishing and distribution in the process of its gradual public accessibility and rapid commercialisation (from early web-based Bulletin Board System platforms such as ARTEX (the 1980s) to experiments with web interfaces in the 1990s (e.g. äda'web, 1995), to projects such as. **CuratingYouTube** (2007-present) and **#exstrange** (2017) experimented with ready-to-use services and responded to the platformisation of the web environment that comes with the so-called Web 2.0 era. Meanwhile, Ghidini (2019) clarifies that in the meantime, we also include presentations of visual material that was not initially intended for the online space in the category of 'curating online.'

NETWORK OF CARE

In her theoretical work, Annet Dekker (2018) refers to 'networks' as organized networks of individuals with a common purpose and as a space that possesses the potential to act as *"collaborative practices that work towards the realization of projects".* (Dekker, 2018, p. 89) Furthermore 'network of care' (Dekker, 2015/2018/2022) is referred to as a network *"based on a transdisciplinary attitude and a combination of professionals and non-experts who manage or work on a shared project".* (Dekker, 2018, p. 91) To administer a project within a network, it is best shared within *"an open system, or a dynamic set of tools"* (Dekker, 2018, p. 91), where all information can be shared, administered, or transferred. The maintenance and monitoring of such a system are also arranged by the network. A 'network of care' *"maintains or conserves (parts of) an artwork [...] and introduces knowledge from a variety of fields and backgrounds".* (Dekker, 2018, p. 14) Dekker (2018) exemplifies this approach by analyzing various net art projects: Olia Lialina's **My Boyfriend Came Back From the War** (1996), Igor Štromajer's performative action **o μ 4×** (2016-2020), or Martine Neddam's web-based work **mouchette. org** (1996-ongoing), among others. In collecting and preserving online art, the collaborative 'network of care' approach is not exclusively linked to the technical attributes of the artwork (the material) but points above all to the existence of the social relations within which the work exists. By stressing collectivity in networks, *"conservation is less about conserving materials and more about the preservation of social information and relations".* (Dekker, 2018, p. 14)

CURATING SYSTEMS

Joasia Krysa (2008) situates curating *"in the context of theories of immateriality, a critical discourse around software art practice, and an understanding of open systems."* (Krysa, 2008, p. 3) Such a system is an open space for exchange and communication at the level of production-user and a place where *"established social relations of production and distribution"* are violated. (Krysa, 2008, p. 3–4) The curatorial process presents *"a collective and distributed executable that displays machinic agency."* (Krysa, 2008, p. 4) The term 'system' in the given context is seen as 'the operating system of art,' representing new possibilities of collective curating. By distributing curating among many different agents, including networks and software, this 'operating system' of art presents new options for collective and distributed curating. (Krysa, 2006, p. 15) The curator is part of the system as a whole; still their role is not central:

> *"Systems are of particular importance for understanding extended curatorial production, which does not only refer to the physical aspect of the computer and the network, but also to the technical and conceptual properties of what constitutes the curatorial object – for example, works distributed through networks, dynamic and transformative systems".* (Krysa, 2006, p. 14) Curatorial practice has gradually moved from the object, past processes, to open network systems. Thus, more factors enter the curator's workload that cannot be separated from technological or socio-political developments because curating represents *"open systems, implying a state in which there is continuous interaction with the socio-technological environment."* (Krysa, 2008, p. 3)

A I   C U R A T I N G

The use of artificial intelligence in curating art collections has expanded considerably in recent years due to the systematic digitization of cultural heritage. In the multitude of such research and application projects, we can identify two basic approaches, which can be characterized as archival and curatorial-artistic. Artificial intelligence is gradually becoming a legitimate actor in digital online curatorial practice.

DATASET

A prerequisite for the use and development of current AI is the availability of datasets for training intelligent software: "*Mass digitalisation, which expanded with the internet in the 1990s and escalated with datacentres in the 2000s, has made available vast resources of data that, for the first time in a history, are free and unregulated.*" (Pasquinelli – Joler, 2021, p. 1266). Developers of AI software focused on visual object recognition most often use ImageNet, which has been in development since 2010 by a research team led by Fei-Fei Li. ImageNet is a database containing 14 million manually annotated images designed for learning AI software. To do this, the research team used a crowdsourcing method of work aggregated through Amazon Mechanical Turk. The creators of ImageNet state that while they do not hold the copyright to the images contained in the dataset, they are making it available for non-commercial use by research teams and for educational purposes: *ImageNet does not own the copyright of the images. ImageNet only compiles an accurate list of web images for each synset of WordNet. For researchers and educators who wish to use the images for non-commercial research and/or educational purposes, we can provide access through our site under certain conditions and terms.* (ImageNet) Pasquinelli and Joler, however, see the free-for-all database content, in the context of the current machine learning boom, as the next phase in the evolution of the knowledge economy, which has transformed into a new forms of capitalism, referred to as cognitive capitalism and surveillance capitalism. (Pasquinelli – Joler, 2020, p. 1266)

AI AS A NOOSCOPE

Pasquinelli and Joler highlight the dangers of accepting the common rhetoric that AI is a magical tool capable of perfectly mimicking human creativity and improving it in many ways. *"The actual problem is the black box rhetoric, which is closely tied to conspiracy theory sentiments in which AI is an occult power that cannot be situated, known, or politically controlled."* (Pasquinelli – Joler, 2021, p. 1265) According to them, contemporary artificial intelligence is primarily a result of the automation of human perception and, at the same time, a means of knowledge extractivism and epistemic colonialism of human work and social behaviour through their algorithmization. (Pasquinelli, 2019) To free the current debate on the artificial intelligence of the haze of the mythical narrative of the magic box, they replaced the term AI or machine learning with Nooscope:

> *"The Nooscope is a cartography of the limits of artificial intelligence, intended as a provocation to both computer science and the humanities. Any map is a partial perspective, a way to provoke debate. Similarly, this map is a manifesto—of AI dissidents. Its main purpose is to challenge the mystifications of artificial intelligence. First, as a technical definition of intelligence and, second, as a political form that would be autonomous from society and the human."*
> (Pasquinelli – Joler, 2021, p. 1263)

By renaming the AI as Nooscope, they are turning attention to AI as a tool for cognition and, therefore, control of our behaviour and aesthetic preferences. *"Nooscope is described as a machine that operates on three modalities: training, classification, and prediction. In more intuitive terms, these modalities can be called: pattern extraction, pattern recognition, and pattern generation."* (Pasquinelli – Joler, 2021, p. 1268) To demystify AI, they dismantle the machine learning process into its fundamental components, which they study separately and in coordination with each other. These are *"object[s] to be observed (training dataset), an instrument of observation (learning algorithm) and a final representation (statistical model)."* (Pasquinelli – Joler, 2021, p. 1265) In addition, they emphasize the distortions, biases and simplifications that affect the output of machine learning, whether these are limitations imposed by the limits of the technology used or constraints written into the output of AI work based on biases written into the datasets by the people involved in their creation. To illustrate the gradual distortion of information as an integral part of machine perception and machine learning, they created a precise diagram that makes their argument comprehensible and applicable to various specific AI use cases (Joler – Pasquinelli, 2020).

AI AS A CURATOR

Experiments with the use of AI in the analysis of digitized art collections show that AI software for image recognition is not universally applicable but requires training software on a suitable dataset for the stated goals. Emily L. Spratt discussed the possibilities of applying AI as a curator from the perspective of art historians in a paper *Dream Formulations and Deep Neural Networks: Humanistic Themes in the Iconology of the Machine-Learned Image* published in 2017. (Spratt, 2017) She expressed her belief that using machine learning for image analysis *"can engage the humanities, complement existing socio-cultural theories, and offer the possibility of new methodologies for image analysis that take cognitive psychology into consideration."* (Spratt, 2017, p. 2) She complemented her claims with a description of her own experiment using machine learning to analyze a digitized art collection. She took software available on the open-source cloud platform called Grad_CAM (Gradient-weighted Class Activation Mapping) by Perception Lab at Georgia Tech and applied it to selected images from the collection of the Metropolitan Museum of Art. (Spratt, 2017, p. 4) The results of the experiment were quite ambivalent. The Grad-CAM, trained on contemporary images available online (ImageNet), made mistakes (albeit interesting ones) when applied to medieval paintings or even photographs from the beginning of the 20th century. In the example of Georgia O'Keeffe, photographed by Alfred Stieglitz, the software interpreted the image as *"a man holding a cell phone in his hand."* (Ibid., p. 4) This is one of many pieces of evidence that the AI software is highly biased according to the data set of images used for its training, and it is, therefore, necessary to take this into account when designing such projects (see the project by Lukáš Spilka Digital Curator, 2022). Despite initial unease about the results of applying AI as a curator of art collections, Spratt and some other researchers believe that the use of AI in art iconography opens up a new evolutionary phase of the discipline, which Spratt called *"the iconology of the age of artificial intelligence."* (Spratt, 2017, p. 12)

The idea of AI as an artificial curator has intrigued not only art historians eager for a technically supported understanding of the content of vast collections of traditional art but also artists and curators testing the potential of digital media. Several notable projects have emerged in which AI software is used in the role of curator. For example, Amy Alexander has created a still-running project, an endless document, **What the Robot Saw** (*2019 -), involving AI software which automatically searches YouTube content. *"A social media AI turned documentary filmmaker, the Robot continuously makes its way through the world of low engagement online video, carefully organizing and describing the people and scenes it features in its documentary. The film is constantly curated, edited, titled and archived algorithmically from among the least viewed and subscribed YouTube videos uploaded over the past several hours."* (Alexander, 2022) The resulting video not only showcases social networking outsiders, whose only audience would typically be an AI software but

also reflects the massive use of AI as "engagement algorithms" and as a tool for automated surveillance of social network users by reversing the function of the algorithm.

Joasia Krysa is the initiator of two experiments with AI (machine learning) as a curator, entitled **The Next Biennial Should be Curated by a Machine: B³(NSCAM)** and **AI-TNB**, which were put forward as a part of the Liverpool Biennial and in collaboration with the Whitney Museum of American Art. In the first project – '(NSCAM)' – the creator team, led by Christiane Paul, focused on generating an exhibition concept using AI trained on a dataset made up of the content of the Liverpool Biennial and The Whitney Museum of American Art's archives of curatorial texts: *"Processing datasets (including curatorial texts) linguistically and semiotically, the AI system 'learns' their style and content, breaking and mixing them together. The generated texts are then presented to the user, with a degree of interactivity and 'branching', iteratively rewriting small parts of its own text at random."* (Krysa, Impett, 2021)[2]

In the second project - 'AI-TNB' - Joasia Krysa and her team focused on using AI as a shadow curator for the current Liverpool Biennial exhibition of spring 2021, curated by Manuela Moscoso. The AI curator created a parallel online exhibition of works displayed physically in different locations in Liverpool: *"The resulting 'curatorial AI system', or an AI Biennial, is an exercise in interaction through large datasets, using computer vision and natural language processing techniques with a focus on human-machine co-authorship."* (Krysa, Impett, 2021)

These experiments aim to explore the potential of AI as a new actor in digital curating and creativity, to try to transfer curatorial 'know-how' to AI through machine learning, and to explore the possibilities of extending current curatorial practice.

CROWDSOURCED BEAUTY OF AI ART

However, AI software trained by machine learning may also be able to generate images similar to those whose common features it has 'learned' to recognize. The AI-assisted image generation was initially presented as 'dreaming' or 'hallucinating' of the machine system. The surreal nature of these images was emphasized by the visual language of the AI's generative lever outputs (**Deep Dream Generator**, 2015). In the next stage, families of images were generated through AI, whose visuals played with the liminal form between impressionistic blurring of contours and the transparency of layers of imagery from which the human face usually emerged. (**Edmond de Belamy** from La Famille de Belamy by the artistic collective Obvious, 2017) However, the latest tools generate images in any known art style (**Midjourney**, 2022), perfectly imitating human work. These are, however, the outputs of a combinatorial game at the level of content and form, i.e., a form of 'remakes' or 'remixes' of digital imprints of products

of human imagination, whose aesthetics are determined by the content of the dataset on which the tool was trained. Current AI tools are virtuoso **imitators** of the results of human creativity, but their computational power can compensate for their limitations to a certain extent. The authors of AI for Arts provided a list of the essentially primitive operations on which AI-assisted image generation is based: *"Analyse and summarise; generate; imitate; translate (mostly relevant for literature."* (Hageback – Hedblom, 2022, p. 50) Ariellie described this modern phenomenon of generative art computer mannerism because these AI software outputs only *"mimic existing styles and are not creative at all. In those instances, computers receive pre-existing examples and generate variants conforming to their patterns, while trying to introduce some level of variation. These algorithms do not generate styles of music or painting that are entirely new, instead, they are instances of what we might call computational mannerism."* (Manovich – Arielli, 2021, p. 7) Joanna Zylinska refers to the mainstream production of AI images, sounds, and texts based on the uncritical use of the tool as crowdsourced beauty. (Zylinska, 2020, p. 51). According to her, this is an art production that uses AI tools and arouses the most attention from the general public, whose aesthetic qualities do not exceed the ambition to look beautiful, i.e., *"symmetrical, mesmerising, garish, and, first of all, similar to what already exists."* (Zylinska, 2020, p. 51) Currently, however, artists are emerging on the art scene who manage to use AI tools in a truly innovative way, respecting the specifics of materiality and functional properties of the chosen medium. The most notable art projects using AI software straddle the line between curatorial and authorial approaches. Notable names include Memo Akten, Refik Anadol and Mario Klingemann.

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THE BLACK BOX: THE *Lock-DOWN* CURATORIAL PROJECT

WHAT TO LOOK FOR IN A BLACK BOX? AN ATTEMPT TO RECAPITULATE THE PANDEMIC EXPERIENCE IN GALLERY MANAGEMENT

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This text is an insight into the life of a city gallery during the turbulent period of the last three years, which have been defined by the pandemic and the ongoing crisis associated with, among other things, the war in Ukraine. This is not a tumultuous period in the organization's history, as it is not shutting down or severely reducing its operations. At least for the time being. Thanks to its status as a municipal contributory organization, Brno *Galerie TIC*[1] has a relatively stable background. In any case, the crisis has accelerated some of the longer-term trends in the gallery's management; in addition, novel developments and challenges have emerged. These include an increased awareness of the social responsibility of cultural institutions, the search for and verification of functional ways of communicating with audiences, or the abandonment and return of presentation to the exhibition space. Still, this focus on one particular gallery is not intended to be a case study; our ambition is to capture the contemporary development of the production, distribution and, to some extent, interpretation of visual art in a more general sense.

The following reflection on the current art management focuses on the **Black Box** project[2], which was created as a response to the *Galerie TIC*'s sudden lockdown and related operational constraints. Nonetheless, it also outlines the context within which this curatorial experiment arises, which are selected projects of other Brno art institutions. Although this contribution is bound to a specific geographical location, the theoretical framing of transformation of local art and cultural institutions, caused or accelerated by the pandemic of Covid-19, references theoretical concepts critically analyzing the state of artistic platforms, institutions or other actors in the period of the lockdown or before it, that is not tight regionally.

We do not yet have sufficient distance from these recent events; they are not events in history that can be processed with already exhausted tools and procedures. Therefore, this reflection is more than anything else a subjective statement of two curators of contemporary art, supplemented with theoretical references. The first of them is the imminent actor, a curator from Galerie TIC and the initiator of the **Black Box** project that will be discussed here. The second actor has cognizance of the institution as its visitor, mainly in the capacity of a teacher attending the institution with her students of curating. She joined **Black Box** additionally as a producer of professional symposia and editor of texts

1   For an archive of exhibitions and the accompanying program of Galerie TIC, including the description of its individual exhibitions, see www.galerie-tic.cz.

2   Black Box / Černá skříňka. (2020 -). Retrieved from https://cerna-skrinka.cz/. The project was created with the support of Theory of Interactive Media / Digital Culture and Creative Industries Masaryk university, Faculty of Arts; with the financial support of Technology Agency of the Czech Republic within the programme ETA (project no. TL02000270. Media Art Live Archive: Intelligent Interface for Interactive Mediation of Cultural Heritage) and the Ministry of Culture of the Czech Republic

that became part of the second phase of this project, which consisted of an artistic and institutional reflection on the pandemic experience. This duality of testimony allows for the alternation of the perspective of actor and observer, allowing for the linking of modes of subjectivity, which can be beneficial in its authenticity and provide a critical distance and lens of generalization.

BEFORE THE STORM

Philosopher and media theorist Boris Groys, in his essay *Comrades of Time* published in the late 2000s (Groys, 2009), characterizes contemporary art as being mired in doubt, hesitation, uncertainty and indecision, requiring longer deliberation or postponement of one's own decisions.

> *"(…) the contemporary is actually constituted by doubt, hesitation, uncertainty, indecision – by the need for prolonged reflection, for a delay. We want to postpone our decisions and actions in order to have more time for analysis, reflection, and consideration. And that is precisely what the contemporary is – a prolonged, even potentially infinite period of delay."* (Groys, 2009, p. 2)

According to Groys, contemporary art is characterised by its repetitiveness and programmatic impersonality, which he likens to the futile fate of Camus' Sisyphus rolling a boulder uphill endlessly. Post-conceptualism and self-referential and epistemological strategies were typical of art at the time, as was the thematization of art's institutional and technological backstory. The art of the last decade is characterized by, among other things, a leaning towards materiality and semi-forgotten hand-crafter techniques and practices. One of the distinctive manifestations of this trend, which is flavored with the ingredients of mass entertainment, consumer aesthetics and life in the online universe, is post-internet art. The more the glow of this comet, which attracted attention in the mid-2010s, fades, the more the emancipatory claims of oppressed actors and the reflection of global crises and catastrophes claim the floor. Mainly, the peripeteia of global North-South relations is addressed, while the complicated relationship between West and East and the persistent self-colonization of Central and Eastern Europe, so aptly captured by Alexander Kiossev in *The Seft-colonizing Metaphor*, still awaits more systematic reflection. (Kiossev, 1995) [3] The acceptance of the responsibility for the consequences of colonization and globalization is demanded, and a postcolonial revision of identities, power relations, and history is underway. These tendencies are evident in artistic production and interpretation, as well as

3   Published in Czech under the title *Metafora sebekolonizace*. Retrieved from http://www.monumenttotransformation.org/atlas-transformace/html/s/sebekolonizace/metafora-sebekolonizace.html

in gallery and educational institutions, which are automatically expected to address their own identities and to take an active stance on general social issues. Logically, the gallery is thus increasingly moving away from its essential purpose, which is exhibition activity, towards community activity. It is formulating disciplinary interests and looking for ways to promote them. In the Czech environment, this tendency is represented by the Skutek association, which was founded in 2013 and is the first respected trade organization to emerge after the fall of communism and the abolition of the concept of state-controlled culture.[4]

It is, of course, tricky to specify the dominant trends in *Galerie TIC*'s exhibition concepts, as such efforts can easily lead to reduction and generalization, but let us admit that in the second half of the 2010s, there were apparent changes. The first half of the 2010s can be represented by exhibition projects that are based on self-reflexivity. A common theme has been the revision of the institution's history and approach to the presentation and interpretation of art (*Jak to vlastně bylo. Devadesátky u Dobrého pastýře*, 2016); the phenomenon of work has been given thought (*Svět práce. Live in Your Head,* 2014) or the compulsive collecting or archiving approach to art (*Výběr ze sbírky*, 2015). The exhibitions were epistemological in nature, addressing how we think about art, how we understand our own position in the artistic enterprise, or how we can understand the events taking place around us through art. These were curatorial projects with a rather authoritative, at times even manipulative, treatment of the artworks represented in the interest of a curatorial message that was itself an autonomous creative act. It is no coincidence that these projects involved female curators who were also working as artists. Incidentally, it was Katarína Hládeková and Zuzana Janečková who also participated in the creation of the **Black Box** project. At the same time, the aforementioned exhibitions can be understood as a symptom of the dissolution of post-conceptualist approaches, which overlaps with trends such as the Emo-Romantic turn, speculative practices, identity crisis and critique of power. Curatorial methods are characterized not only by the mixing of artistic and curatorial positions, which is, in fact, a long-term phenomenon but also by the awareness of collective identity with attention paid to the political dimension of this reality.[5]

4   This is not so obvious given the relatively small membership base (currently about ninety members), but it is a very important milestone in Czech art. The formation of this association disrupts the general resistance to the institutionalization of artistic production and to art associations related to the discrediting of the power apparatus during the normalization period. See https://spolekskutek.cz.

5   In the Czech environment, a symbolic confirmation and institutionalization of this tendency is the creation of *Kodex feministických institucí* (The Code of Feminist Institutions) in 2017which calls for ethical responsibility and consistent compliance with gender and professional equality, among whose signatories are (so far) only institutions from the circle of non-established culture, such as Artalk magazine, Artwall Gallery, Display, Jindřich Chalupecký Society or tranzit.cz.

Figure 1: From left to right Katarína Hládeková and Zuzana Janečková, co-creators of the Black Box project.

Feelings of skepticism about the environmental crisis and the impossibility of finding a workable alternative to the capitalist order reinforce the need to escape into nature and the periphery. This trend, which has been growing in the Czech environment since the 2010s, is illustrated, for example, by the *Les* festival (*Forest* Festival) organized by the *Institute of Anxiety*. Representatives of the Prague art scene are leaving the urban setting and the usual institutional background and moving their cultural activities to the forest. The photograph of Vít Havránek, a curator and teacher at the Academy of Fine Arts, lecturing among the tree trunks to the audience sitting and lying on the ground is apt in this respect. Respectively, it is not so much about the captured situation as it is about publishing its footage on social media as an important, if not the central referent of the whole situation. These projects are more or less rigorous or proclamatory performances of the transformation of their actors, which tend to be published on social media, where they represent images of idyll and paradise regained. They combine the need to seek authenticity rooted somewhere in romanticism with the need to escape the economic and social 'difficulties' of the city. Hand in hand with this goes the determined pursuit of the concept of authenticity and self-help discourse. There is an emo-romantic turn that reinforces the importance of feelings, authentic experience, sincerity and emotionality. In the drama-

Figure 2: Markéta Filipová (2020).
Aquarelle, author's archive

turgy of *Galerie TIC*, this tendency is represented by the curatorial project of Katarína Hládeková and Zuzana Janečková, **Boží dílo** (God's Work), which took place in the summer of 2018. Its significance lay primarily in its simultaneous placement in the gallery environment and outside of it. It was not, therefore, a programmatic abandonment of the exhibition institution and the use of alternative forms of art presentation, but an 'ecumenical' merging of these two modes. And not only that, it was also about combining what is called ´professional art´ with ´spontaneous art´, not distinguishing between the work and the private, and juxtaposing real nature with its artistic representation. If the sudden impetus for the **Black Box** project had not been the global pandemic and lockdown, then we could consider this project as an expression of the continuity, of the institution's longer-established programmatic and ideological diversity, including its inclination towards collective curatorial practice. It is clear that this is not specific to *Galerie TIC*, but rather a more general tendency that the pandemic has only reinforced.[6]

In his 2011 text, *The Paradox of Authenticity*, the Danish philosopher Somogy Varga speaks of a pandemic of depression motivating the desire for authenticity and spontaneity. (Varga, 2011, p. 13) As Václav Magid aptly notes in his article *Jinde a jindy*, *"The fundamental value that contemporary art embodies and celebrates is the freedom of the individual, breaking down all obstacles that stand in the way of his self-realization"* (Magid, 2021, p. 23). However, the push against alienation instead of self-fulfillment encourages additional stress related to the performance of one's own uniqueness or the over-projection of emotions into the work. One of the paradoxes of contemporary attempts to achieve authenticity is that the process of stepping out of the status quo of neoliberalism is simultaneously an affirmation of it. Into this constellation enters identity politics, which only reinforces the need for individualization.

The equilibrium has collapsed, we have destroyed our climate, we admit that we cannot replace the exploitative system of capitalism, and we watch our mental state being eroded by anxiety. Yet, as late as the end of 2019, we suspected future threats. The forms of the apocalypse were being formed, the symptoms of crises were detected, and less often, ways to confront and escape the threats were sought. These were not, in any case, crises that particularly clearly affected our daily lives as the pandemic of Covid-19. For some, the climate crisis was more or less an abstract threat, a weighty but rather distant one that we were only occasionally aware of, like the fact that, for example, Syria is still at war and that people are suffering and dying as a result. For others, civic engagement has become a defining link to society, a way of life,

6   The curator Zuzana Janečková, who worked at Galerie TIC between 2013 and 2020, continued in this direction even further: she moved to the village of Važec in the Tatra foothills to run a residential center and to search for the most "authentic" of all possible worlds, both in accordance with her own origins, mood and current interests.

an artistic program, or at least an approach to be actively encouraged. It is incredible how close the global crisis was. Except perhaps for the spread of the HIV virus that causes AIDS in the 1980s, the pandemic was not on the register of catastrophic threats that local society faced. The current threat of climatic collapse was preceded by the fear of nuclear war, which had weighed heavily on the generation of Husák's children[7] and which has recently been revived with the outbreak of war in Ukraine. Pandemics did not figure in the catastrophic models but were relegated to history, to third-world countries, or to the subjects of action thrillers[8]. The belief in the omnipresent power of medicine and the self-evident sense of the inviolability of 'our advanced civilisation' prevailed in society, and such dangers were somehow not accepted.

ONLY ARTISTS WILL SURVIVE

In March 2020, when the first lockdown was announced, we began to experience something unprecedented: fear, constant uncertainty and enforced loneliness as a consequence of anti-pandemic measures. Some, however, also took this forced shutdown as a unique opportunity to experience the desired slowdown, to learn the concept of no growth, and to experience spring, which was particularly lovely that year. Others, aware of the failures of public institutions, threw themselves into help- ing the needy in every way imaginable and saw this period as proof of the vitality of civil society. In the costume shops of theatres and some galleries, masks were being sewn, of which there was an acute shortage in the Czech Republic then. My colleagues and I met in the empty building where our gallery was located and thought about what to do next. Is it necessary to find sewing machines and learn to sew? How can the art we do in our various professional capacities be useful in these times? And can it be beneficial at all?

Consequently, we proceeded to reassess what the content and mis- sion of curatorial work and cultural institutions should be. We realized that if art is an important tool for understanding the world, then we do not only need epidemiologists and economists to understand or accept the cur- rent situation but also artists. What then is the task of the contemporary art gallery in this situation? First of all, is it to signal to artists that their work (or profession) is demanded even in these exacerbated conditions? Or rather, that it is required right now? But how to communicate this attitude at a moment when we cannot officially meet anyone, let alone

convey it in the usual modus operandi, i.e., in the form of an exhibition, curatorial interpretation, discussion or another public event? Motivational posts on social media cannot solve this. There was only one option: to give individual support in the form of creative scholarships. However, this is not standard gallery practice, as only two financial transactions be- tween galleries and artists are standard so far: either purchases of works for collections or support for the creation of artworks for exhibition in the respective gallery. Scholarships for creative work are, by the way, a relatively neglected genre in the Czech environment[9], and yet they should be one of the pillars of public support for the visual arts, which

9   The Ministry of Culture of the Czech Republic awards creative schol- arships with the paradoxical condition that the applicant is only allowed to use them twice in their lifetime. Municipalities or regions do not grant similar scholarship support at all, and their only activity in this area is the quite exceptional offer of subsidized studios within municipal properties.

Figure 3: Self-help sewing of masks (2020). Vojtěch Kundrát's archive

7   "Husák's children" is a name given to the generation born during the period of the so-called political normalization, when Czechoslovakia was led by President Gustáv Husák. This phase of the 1970s and 1980s, following the occupation of Czechoslovakia by the Warsaw Pact forces in 1968 and the subsequent end of social reforms, is characterized by a sharpening of power and ideological surveillance.

8   Contagion (2011) Official Exclusive 1080p HD Trailer – YouTube

do not have cultural institutions that could employ performing artists[10]. Contemporary art galleries are ideally suited to manage their awarding, as they have a direct relationship to the artistic community and are therefore able to respond quickly to its unforeseen requirements and changes. The funds for the scholarships were drawn both from sources that we could not use at the time to ensure our own regular cultural activities, and from a special governmental subsidy to support culture during the pandemic.

We formulated an open call: *Galerie TIC wants to support the creation of art at this pivotal time. We are looking for artists or collectives who will process and document their experience of the Covid-19 pandemic, quarantine and the related social collapse, but also the new wave of activism and solidarity. For example, they may focus on current forms of social practice and communication, visual trends, media criticism, existential crisis, demands on the future, etc. We are aiming to capture our new reality through artistic research directly. The material, technical or conceptual conception is entirely up to the artists' discretion.*

10   Among artists of all disciplines, 85% are freelancers and only 15% are employed. This ratio was published in connection with the initiative Status umělce (Status of the Artist), which should lead to legislation and related anchoring of the profession, which is still "floating in the air" in the Czech Republic.

Figure 4: Max Máslo's illustration accompanying the open call for Black Box published in April 2020. Archive of Galerie TIC
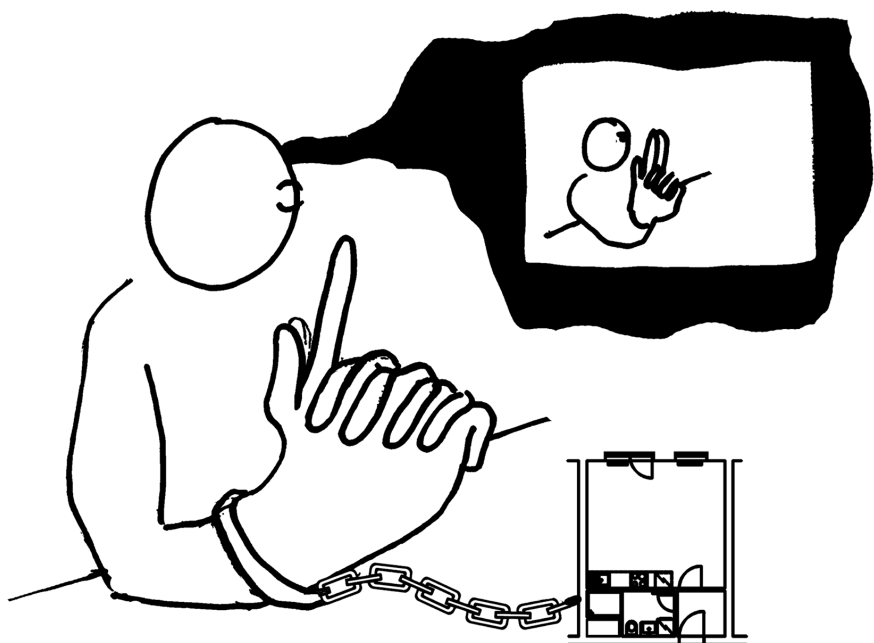
We entitled the initiative simply **Black Box**. The association with a car crash reveals, among other things, our fear of the then-unknown threat of an impending pandemic. We assumed it was art that would be able to both reflect and process this experience effectively. It is art that can act as a black box in which to seek a record of the course of a former catastrophe. What use will the daily numbers infected be to anybody or the sensationalist media news in a few years?

A total of thirty-three artists responded to the call but given our limited resources, we could only support eight of them. We selected artists of a rather diverse aesthetic nature to collaborate with, including students or recent graduates of art schools, as well as experienced artists of the middle generation. We have tried to select compelling projects that were a consistent part of the artist's previous artistic practice and that also related in some way to the current pandemic experience. It was also important to us: not a single one of the selected projects was created on purpose, but the authors had already been working on them before the call was announced. Our selection included the photographer Polina Davydenko, painter Markéta Filipová, intermedia artists Ondřej Homola, Juliana Höschlová, Johana Merta and Tomáš Moravanský, sound artist Ladislav Mirvald, as well as a chemist and art activist Vojtěch Kundrát. These were primarily local artists with whom we have often collaborated in the past and prepared a joint exhibition. Especially on the level of project implementation, in which case, in the situation at the time, we were left with social networks or an online archive, which we had previously used only for communication and documentation of our program. Nevertheless, it should be noted that mixing the implementation levels and documentation was already a pre-pandemic practice, consisting of the fact that artworks exist primarily on the level of documentation because they are typically installed and stored temporarily and resemble props in their provisionality. In other words, we allowed ourselves to present and interpret "only" a record of art that we would probably not be able to convey in reality. The role of the gallery as an art mediator was suppressed or rather neglected, to be replaced by the role of a co-producer of art.[11]

11   This transformation was not limited to the lockdown, but persists beyond it, as evidenced by the initiative Status umělce addressing the working conditions and social status of the artist at the level of individual EU Member States in the framework of the so-called National Recovery Plans, which was launched in response to the Covid-19 pandemic. For comparison see https://artalk.cz/2022/10/17/status-umelce-a-umelkyne-se-sam-nenapise/

Among the projects that have become part of the **Black Box** project, more classical genres such as diary entries, drawings and illustrations are represented, as well as participatory or activist projects. Vojtěch Kundrát formed a close connection to it with a clearly formulated attitude towards it in a project that follows the author's long-developed concept of "activist chemistry"[12]. The first Covid wave in the Czech Republic was marked by a shaking of confidence in the competence of the state apparatus, one of the essential manifestations of which was the complete lack of protective equipment, especially masks. This fact activated civil society and strengthened its self-sufficiency. **Vojtěch Kundrát** and his team of volunteers, therefore, created nanofibre protective masks, which they distributed for free. A special group among the projects represented are

12   The author has applied the concept of "activist chemistry" for example in the use of nanotechnology to solve the fatal water shortage in African countries.

the observatory outputs of **Tomáš Moravanský** and **Ladislav Mirvald**. Moravanský's footage of his own exhibition at the *Brno House of Arts*, automatically captured by a webcam, captures the absolute mortification of a public institution where only things and machines remain because, without viewer interaction, art is reduced to the material level of "things". The sound recordings of Ladislav Mirvald, made in concert halls and music clubs, which suddenly found themselves in a post-apocalyptic silence, have a similar effect. **Johana Merta** and **Polina Davydenko**, on the other hand, carried out participatory projects searching for ways to maintain the necessary social ties and mental health even in isolation. Davydenko turned to her own community of friends, for whom she sought a modus operandi for their meeting and sharing under conditions of lockdown-restricted social contacts. Johanna Merta's project was situated within the broader and more erratic social structure of her village neighbours, whom she sought to motivate in their determination not to succumb to fear and anxiety. The list of participants is rounded off by artists who work with more classical media forms and whose connection to the covid experience is at the same time more abstract or loose. **Ondřej Homola**'s collages, referring to the genre of satire and cartoon humour, gloss over social conditions. **Markéta Filipová**'s watercolours have the character of introspective records, insights into the artist's fantasy world of love and harmony, where one can safely hide from the covid reality.

However, it is not strictly necessary to look for 'records of the crash' in the collected works of art. It would wind up being a one-sided interpretation. In fact, during the period in question, many cultural projects were created that used the crisis as an effective marketing tool that reliably attracted wider social attention and thus the desired financial and media support. An example of this is the travelling exhibition **Helpful Art in Covid**, which mechanically grafted visual representations of the pandemic onto various pop culture references, but whose main motifs were nothing more than the display of various representations of the coronavirus and the masks[13]. In the **Black Box** project, on the other hand, we wanted to avoid any instruction or manipulation. Demanding that the artists thematise the crisis with legible attributes seemed to discredit all of us, i.e., the artists, the curators and, of course, the audience.

So, what is the metaphor of the black box, which appears in the project title, referring to? It refers not so much to the body of artworks supported but to the transformation of our gallery institution during the health crisis. This micro-story of ours has confirmed that galleries cannot serve as showcases for art but should – and must – also be producers and patrons of contemporary art. The Coronavirus crisis thus contributed to further questioning the gallery institution as a mausoleum that only fixes and petrifies art (Magid, 2019).

13   The project Helpful Art in Covid has its own website where the whole project is communicated as an Online exhibition – artincovid.com

THE SPRING OF 2020: PARALYSIS OF ART INSTITUTIONS?

The locally anchored Black Box project, which the chapter has been exploring so far, is set in a specific geographical, ideological, and institutional framework of one particular gallery, which awoke to the new and unprecedented conditions of the spring of 2020 in the same way as perhaps most of cultural and artistic institutions around the world. As in the case of the Brno-based *Galerie TIC*, the lockdown caused by the Covid-19 pandemic forced them to lock their doors and to (re-)examine their well-established methods for displaying and distributing art. Traditional art institutions are entering the online space at the beginning of 2020, which they have until then mostly used as a practical and pragmatic tool to share information about their own activities or programs. Until that moment, the web has primarily been the territory of online art communities, web-based art, net

art or transformed curatorial projects, evolving in the web environment gradually since the late 1980s[14]. This circumstance necessitated that the categories of curating, creation, and distribution of art, as institutions had utilized them before this period, had to be revised and modified for this ´new world´. The methods of relocating or translating exhibitions from the physical spaces of galleries and museums to the online environment had to be re-considered, as well as the user, functional, and aesthetic aspects that the web space may provide. But the situation, which appeared problematic in many respects at first, also brought with it a liberating aspect that contemporary cultural production on the Internet contains. It might be, for instance, the "organizational aesthetics" (Goriunova, 2012) of the web environment, which does not refer to art as we know it, but

14 See Ghidini, M. & Tedone, G. & Dekker, A. (2021). *The Broken Timeline*. *Retrieved* from https://thebrokentimeline.valiz-makingpublic.net/About

Figure 6: Johana Merta (2020). *Neboj se a neplač* (Don't be Afraid and Don't Cry). Recording of the event. Author's archive

Figure 7: Johana Merta (2020). *Neboj se a neplač* (Don't be Afraid and Don't Cry). Recording of the event. Author's archive

offers opportunities for insight into difference and contemplation that liberate us from the closed debates about form and content and direct us instead towards paths of experimentation, invention, humour, or collapse. (Goriunova, 2012, p. 17)

The challenge for traditional art institutions in the spring of 2020 was to create online exhibitions that might not just be seen as a means of promoting or sharing work that would otherwise be seen in a physical gallery but as a diverse set of cultural practices that are both connected to and distinct from traditional exhibition. In this context, Michael Connor notes in early 2020 that an *"online exhibition can be more than a space of simulation, documentation, promotion, and access."* (Connor, 2020) The transformation of the physical program into the online environment had not always been fortunate, particularly in the early days of lockdown, when the formerly physical, walkable, and locally restricted exhibition spaces were frequently replaced by digital, non-walkable, and globally accessible exhibitions. We have witnessed a surplus of online walkthroughs of physical exhibitions installed in galleries, live-streamed events, online lectures, workshops, or guided tours of exhibitions that have become temporarily inaccessible in the physical space. Dekker (2021) observes that the physical and digital in museum and gallery production have blended, with web-based displays increasingly becoming digital reflections of exhibitions installed in physical museums and galleries. The result was virtual simulations of physical space enabled by various software, with static photographs of artworks, whose presentation on the web was accompanied by their descriptions, as if we were leafing through a catalogue. However, curating on the web means more than *just "browsing the catalogue with a new interface".* (Dekker, 2021, p. 19)

A traditional physical gallery *Upstream Gallery* in Amsterdam, the Netherlands, responded to the changed conditions of the transition to the online environment quickly after the lockdown was announced and already on the 10th of April, 2020 launched their first exhibition in the new online gallery *WWW.UPSTREAM.GALLERY.* The exhibition entitled **QUIET, CALMS, STARING**[15], curated by Rafaël Rozendaal, was a selection of thirteen artists who use the web as their artistic medium. By setting up this online gallery, Upstream Gallery drew attention to the difference in organizing exhibitions (including digital art) in physical and online spaces. In the curatorial text for the next online show, **THE NEW OUTSIDE**, which opened in May 2020, the gallery stated:

15 Upstream Gallery Amsterdam. (2020). *QUIET, CALM, STARING.* April 10–26, 2020. Curated by Rafaël Rozendaal. Retrieved from https://www.upstreamgallery.nl/exhibitions/172/quiet-calm-staring

Figure 8: Ladislav Mirvald. (2020). *Ticha* (Silences). Photo: Eva Rybářová. Archive of Galerie TIC

"For this exhibition, no works have to be shipped. No one has to leave their house. And best of all: the works can be experienced in full glory. The only thing you will need is an internet connection. So sit back and enjoy!" (Upstream Gallery Amsterdam. The New Outside. 2020)

The gallery has thus practically tested the extensive theoretical research carried out in the past decades, which thematises the issues of the presentation of (digital) art online and in physical space. (Schleiner, 2003; Krysa, 2006, 2008; Paul, 2007, 2008, 2009; Cook, 2008, 2010, 2013; Ghidini, 2015, 2019, 2021; Tedone, 2019, 2021; Dekker, 2021; and others). In the studies in question, it is often said that from the perspective of online curating, the presentation of art can hardly ignore the specificities of its environment and has to deal with these changing contexts.

Similarly to the exhibition, the process of curating an online exhibition takes place in the non-locality of a distributed network. Unlike curating a physical gallery exhibition, curating on the web requires the creation of an operational framework and structure - a website - to which the cu-

rators' work and artistic production must adapt. In the statement *"I am what I link to"* Schleiner (2003) summarizes the ontological condition of online contextualization through networking. She compares an exhibition in a physical space and an online exhibition, concluding that while an exhibition presented in a physical space has a set opening, start and end date, it must be visited physically. Once completed, it becomes part of a 'cultural archive' through the catalogue, documentation or critical reception; the online exhibition is intended for a trans-local community outside the physical space and (if it were technologically sustainable) could exist within a network of related and previous exhibitions that can be viewed in multiple browser windows simultaneously.

As noted above, in the early days of lockdown, several galleries and museums sought to rapidly translate their physical exhibitions into the online environment, which often manifested itself in a way that *"mimicked and kept to the standards of the gallery spaces"*. (Dekker, 2021, p. 42) However, it was also possible to take notice of art institutions, platforms or projects that, in a given situation, chose to avoid listening to the demands of immediately overwhelming the web with their exhibition program or to transform their physical exhibitions into virtual space. Gaia Tedone (2021) points out that this was a situation that concerned, above all, institutions dedicated to digital art, whose practice for several decades now had included the implementation of online exhibitions. Some of them have taken the opposite approach to the closure of physical galleries and decided to *"go quiet for a while"*. (Tedone, 2021) As an example of such an institution, she cites *Green Cube Gallery*[16], a nomadic online/offline space run by artists that tests the limits and relations between the virtual and the real, and does not associate art with its material existence in the form of artefacts, but defines it as a set of events and states. (Green Cube Gallery, web) Revisiting this example, Tedone (2021) observes that certain institutions demonstrated a withdrawal into a state of hibernation in the early days of lockdown before 're-living' again a few months later[17].

The Czech environment is not characterised by a wide range of online galleries or virtual art-sharing projects that would exist before 2020, so it is difficult to compare the situation with similar platforms. Perhaps the most significant online gallery in the local Czech environment can be considered **ScreenSaverGallery**, a curatorial project that is the joint work of internet artists Barbora Trnková, Tomáš Javůrek and curator Marie Meixnerová. This online gallery is an experimental project, utilizing the unused function of a screensaver to present art[18].

16   Green Cube Gallery. Retrieved from https://greencube.gallery/

17   See text in this publication: Tedone, G. 2020 *Digital Odyssey: Online or Nothing*

18   More information at https://screensaver.metazoa.org/.

The *Brno House of Arts* can be named here as an example of a gallery of a more traditional type that is quite advanced in its approach to the long-term mediation of digital art and the openness to the quest for ways to make art accessible during the lockdown. Between February and April 2020, at the very beginning of the closing of cultural institutions, an installation of objects by the artist Tomáš Moravanský, **Still Left** (2020), was exhibited in one of the buildings of the House of Arts in Galerie G99. The installation *"develops the idea of grasping the perceived world as a virtual one and using the object to set it in the space of the gallery as a place intended for an intellectual and contemplative walk. In doing so, it creates a paraphrase of a game that has no outcome but only possibilities."* (Artalk, 17. 6. 2020)

Due to the closing of the gallery as a result of the lockdown, only a few visitors were able to visit the exhibition, so a video in the form of an online installation walk-through was created. The seemingly trivial idea of bringing the exhibition to the public in the form of a recorded video is in fact a performative artistic act, a meditative wandering through the gallery space, much as it was intended as a physical installation. Another ideological lineage of Moravanský's project is also reflected from the pre-pandemic period into the lockdown period. A time-lapse collection of photographs was created under the title **Still Files**, an artistic project realized within the framework of an open call and with the support of Brno's *Galerie TIC* as part of the curatorial project **Black Box**[19]. The series of photographs was captured throughout the duration of the exhibition:

"Every day after opening hours, at a time when the gallery remains deserted, photographs were taken from security cameras as a summary of the entire day, documenting the movement and activity of visitors. Before the gallery opened, the exhibition was restored to its original state, with destroyed boxes replaced with new ones. The photographs were also recorded after the galleries had closed completely due to the spread of the virus (dark photos)" (Artalk, 17. 6. 2020)

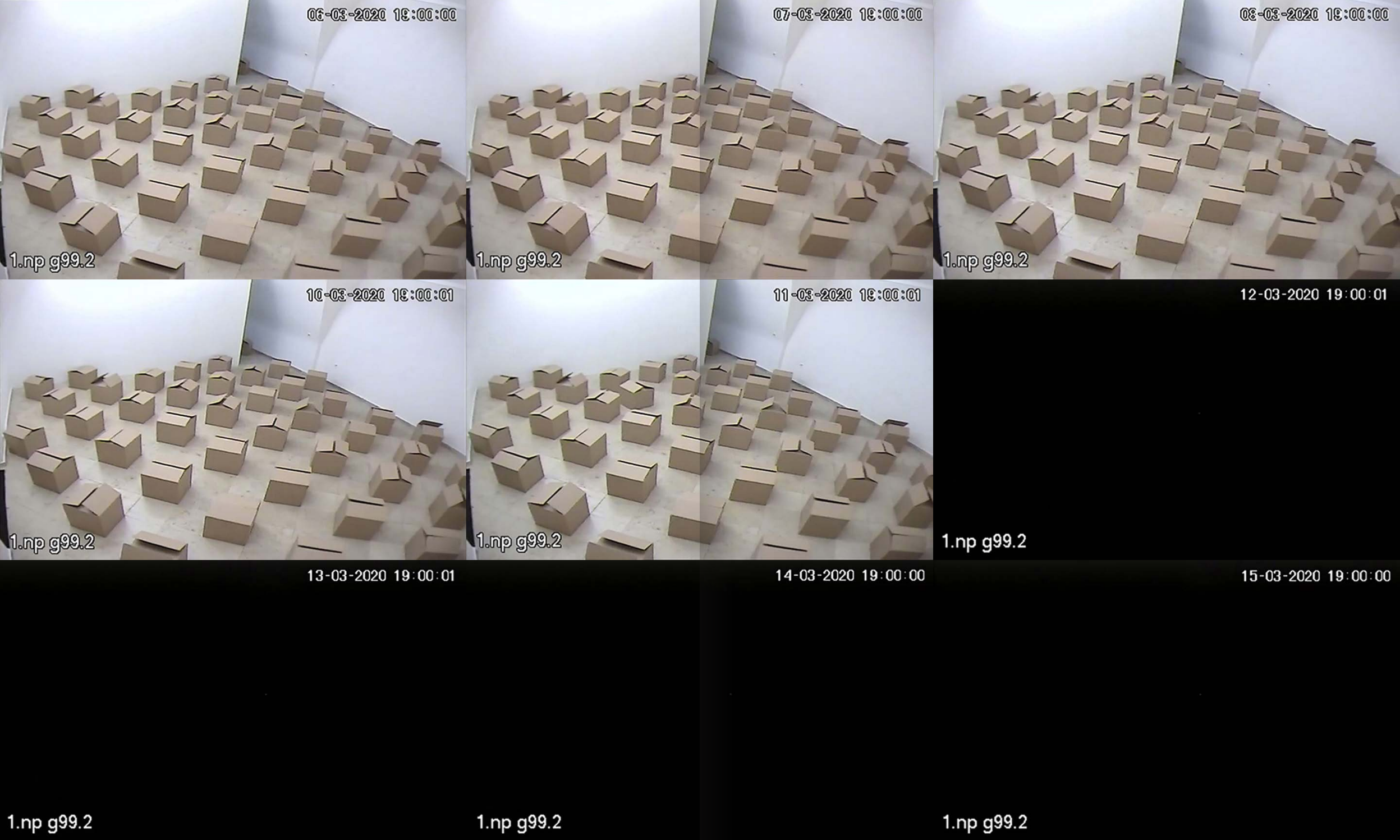19   Moravanský, T. (2020). *Still Files*. Black Box / Černá skříňka. Retrieved from https://cerna-skrinka.cz/prj/tomas-moravansky-2020

Figure 9: Tomáš Moravanský (2020). *Still Left*. Galerie G99, print-screen from the web. Retrieved from https://www.dum-umeni.cz/still-left/t5809
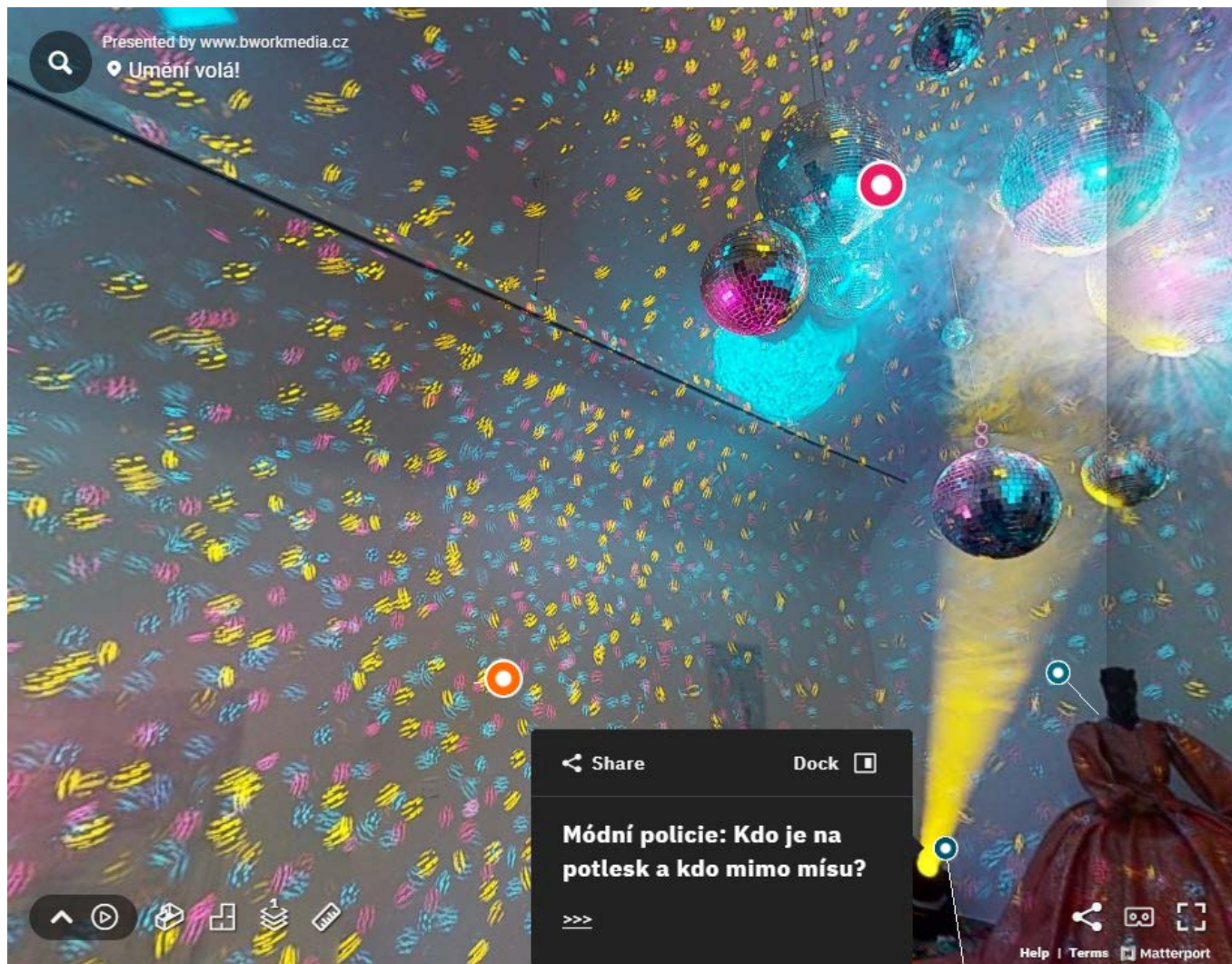
Umění volá! (Art Is Calling) (2020). Curator: Rostislav Koryčánek. Dům pánů z Kunštátu (House of the Lords of Kunštát), print-screen from the web. Retrieved from https://artiscalling.cz/

Consequently, with the necessary time distance, the *House of Arts* attempted to implement exhibitions installed in physical space during 2020, but the exhibition **Umění volá!** (Art Is Calling),[20] Faculty of Fine Arts, Brno University of Technology (FaVU VUT) curated by Rostislav Koryčánek was created directly for the online platform https://artiscalling.cz.

Over the course of one month (5. 11. 2020 – 30. 11. 2020), an exhibition was installed in this online gallery, which was a curated selection of diploma works by art students from the Czech Republic who graduated in 2020. (Dům umění, 2020) A virtual 3D model of one of the buildings of the House of Arts, *Dům pánů z Kunštátu* (the House of the Lords of Kunštát), was created, in which the works of the graduates were placed. In terms of the method of conveying content, the exhibition materializes the translation of physical space into digital space while enriching the digitized space with a new dimension - emphasizing the characteristics of the web (utilizing the potential of 3D and moving through the exhibition without respecting the laws of gravity). That is, qualities that cannot be experienced when visiting an exhibition in a physical space. (Dekker, 2021, p. 27) The virtual model of the exhibition also promised a few surprises, which took the visitor to places where they would not normally go (for example, the terrace space above the courtyard of the Dům pánů z Kunštátu, which is normally inaccessible to the public). (https://artiscalling.cz/, 2020) The exhibition is an example of curating on the web, reflecting the ecology of the adopted technology (in this case, the web) (Ghidini, 2019).

As mentioned earlier, some institutions, platforms, artists or curators have been exploring the web environment for the presentation of art for several decades (see the project *The Broken Timeline*, 2021).[21] However, in the case of the more traditional ones, we can see lockdown as a trigger for accelerated research into the online environment, which enabled the mediation of art exhibitions that could not be installed or visited in the physical space of museums or galleries. At the end of the same year and in the months that follow, this new territory, which has seen a significant amount of settlement with a variety of online exhibitions and their guided tours, workshops, or discussions during 2020, starts to validate and analyze new communication, distribution, and curatorial strategies. This is done not only by the institutions themselves, but also by theorists and curators, and so by comparing several major museums and galleries (including the Getty, the Uffizi Galleries in Florence, and the Hastings Contemporary in the United Kingdom), for example, digital media theorist and curator Annet Dekker concludes that *"it seems institutions have barely changed and learned little when it comes to curating online exhibitions"*. (Dekker, 2021, p. 43)

20 Retrieved from https://artiscalling.cz/

21 Ghidini, M. & Tedone, G. & Dekker, A. (2021). The Broken Timeline. Retrieved from https://thebrokentimeline.valiz-makingpublic.net/About

CURATING ONLINE: THE NEW NORMAL

"Every single day, more hours are spent looking at a screen than looking out of a window, the screen is our new landscape. Who defines and who depicts this landscape?" (Dullaart, 2020)

The space of the web cannot be reduced to a medium or a tool; it combines cultural practices and represents

"socio-technical culture that has enriched and transformed curatorial and art practices with new ways of creating and co-creating, sharing and viewing, questioning traditional concepts and notions of authenticity, authorship, ownership, and relations between curators, artists, institutions and audience members". (Dekker (ed.), 2021, p. 299)

Within the confines of the web, a new order of art is emerging, the status of the art object is changing, and curatorial practice is being transformed. The computer or other medium mediating the gateway to this space is a form *"through which all kinds of cultural and artistic production is being mediated"* (Manovich, 2001, p. 76), a window into the web browser, a virtual analogy of the walls of traditional art galleries.

Online exhibitions, but also their accompanying programs, including the theoretical ones (conferences, symposia, etc.), which have moved into the space of the web since the beginning of 2020, seem to be becoming the new normal: *"the online world became 'the new normal' for those with computers and stable Internet connections".* (Dekker, 2021, p. 11) Inhabiting the online world becomes 'the new normal' as a result of the lockdown, and the Internet network is 'the new outside'. Constant Dullaart, in his curatorial text for the exhibition **THE NEW OUTSIDE** (2020) reflects on the current state of social and economic lockdown and talks about 'the new outside' that has resulted from it:

"A window to the world we take to the bathroom, a window to imaginary new landscapes. A landscape with newfound urgency, with a private view on social relationships, family, other bodies twisted in time and space, keeping distance. Do we use the commercial methods easiest to us, or do we seize the opportunity to imagine our own ways of being together? Unimaginable amounts of living rooms tethered together by untraveled roads and well charged devices allow reinvention of who we are in time and space, beyond the cookies in our browser. The network has become our outside, but who deals with the depiction of this new outside? Which ideologies pass the horizon; how do we navigate the opaque infrastructures? Instead of only looking on your screen, through this window to the new outside, will we come out to play or walk in line? Who will help redefine this important space to give hope, offer new ways of seeing, reflect, create new worlds, make art?" (Dullart, 2020)

Several years before exhibition institutions entered the online space to mediate art during the pandemic, Marialaura Ghidini (2015) explored the ways in which curatorial work has changed according to curators' understanding of the technology used for their projects. For Ghidini (2021), the curatorial environment of the web is an area of practice that, because of its site-specificity, moves away from the protocols of implementing exhibitions in a gallery space. She argues that this area of curating requires a revision of concepts of authorship, selection and display, collection and archive, as well as audience participation in the artistic and curatorial process (Ghidini, 2021).

For traditional art and cultural institutions, the network environment provides a different type of social space for the production, distribution, presentation, and archiving of contemporary (and not only media) art. Closely related to this practice in a networked environment is Dekker's term 'network of care', which views networks as organized networks of individuals with a common purpose, and as a space that possesses the potential to act as *"collaborative practices that work towards the realization of projects"* (Dekker, 2018, p. 89). 'Network of care', in the context of the production, mediation and preservation of art, can be described as the 'curatorial network of care', that is a situation where the lockdown caused by the Covid-19 pandemic accelerated, for many cultural institutions, the establishment of network connections and relationships that were crucial in the efforts to promote or even save art and culture (an example of which is the **Black Box** project presented here). The 'network of care' implies the presence of a sum of actors (curator, artist, art institution, etc.) who collaborate to achieve a certain goal

(e.g. the implementation of an exhibition); the adjective 'curatorial' then connotes the mode of realization of this collaboration, that is, curating as a *"mode, not a simple question of display or production [...] curating is not about the display of work (be that in a gallery, or on the Internet), it is about the development of critical meaning in partnership and discussion with artists and publics"*. (Drabble, 2003)

In a networked environment, curation is distributed among several actors - in addition to the actors, as mentioned earlier, software and technology networks are also crucial in this context. This vast ecology of human and non-human relationships and connections means that the curator, like the programmer, must be able to demonstrate an understanding of the complexity of social relations in a space of distributed systems. (Krysa, 2006, p. 22) Online curation enables new ways of producing and displaying art, while *"curating on the web is, at its core, responding to the characteristics of the web medium, its tools and interfaces."* (Ghidini, 2019, p. 3) The extension of everyday lived reality enforced by media has fundamentally affected our technological experience of it. From the perspective of the content consumer - it is framed by screens as windows to the 'new outside'. Our public life unfolds in a networked environment that we have constructed, and the landscapes mediated by our screens are defined by the technical parameters of the screen of the particular type of media we use to enter our new outdoor spaces (computers, tablets, mobile devices, and so on). The experience of this synthetic reality varies depending on the size of the computer screen, the quality of the image resolution, the orientation of the screen, the physical space that surrounds us at the moment we are looking through the screen window, or the internet browser we are using. The 'new outside' is conveyed in many formats, but also in many contexts. Mediating art through the interface of a window looking into new spaces inhabited by art creates new visual experiences and new ways of perceiving the materiality of the work and the viewer's aesthetic experience of it.

THE BLACK BOX PROJECT AS A 'LIVING ARCHIVE' AND A 'NETWORK OF CARE'

The enforced and sudden transition of institutions that before 2020 did not use the web as a medium to present, mediate, or curate their exhibitions on the one hand, and the muting of the activities of some curatorial and artistic projects already using the web as a curatorial and conceptual tool prior the lockdown, on the other hand

"underscores the opposing views on how art (or curating) on the web, and more generally technology, is understood: as a tool to mimic the practices and dynamics of the white cube, or as an ecosystem in which cultural, economic, social and technical dimensions converge and hence changes the definitions of art and curating."
(Ghidini & Tedone & Dekker, 2021, p. 299)

While some art institutions can be seen as falling into the category of mirroring their program traditionally implemented in the physical space and transferring it into the space of the web, other institutions or festivals of contemporary (media) art have perceived the web as an ecosystem. It is through the lens of the circumstances that occurred in the spring of 2020, that has helped to extend their program to international participation and audiences, freeing themselves from the burden of having to move physically, while at the same time utilizing the typical characteristics of digital media to convey content (such as interactivity, hypertextuality, etc.) or, for example, testing models of curation by artificial intelligence algorithms.

The curatorial-research platform **Black Box**, which was formed at the beginning of the lockdown (2020) at Brno *Galerie TIC*, responds at its core to the pandemic and the related lockdown, seeking to reveal the challenges that Czech art and culture faced during this period. By its very nature, it is situated between an archive, a curatorial experiment and an online art gallery. At the same time, it represents an 'open network' (Terranova, 2006), shaping a communication that transcends physical space and in which the social, the technological, the cultural and the artistic interpenetrate and interact. It is close to a platform as defined by Goriunova *"A platform often [also] puts effort into translating digital creative processes into offline and more official cultural scenes"* (Goriunova, 2006) by translating art projects presented on its website into physical installations, both in the gallery and in public space.

Through its activities and program, **Black Box** contributes to a critical reflection on the current state of the art and cultural production, which
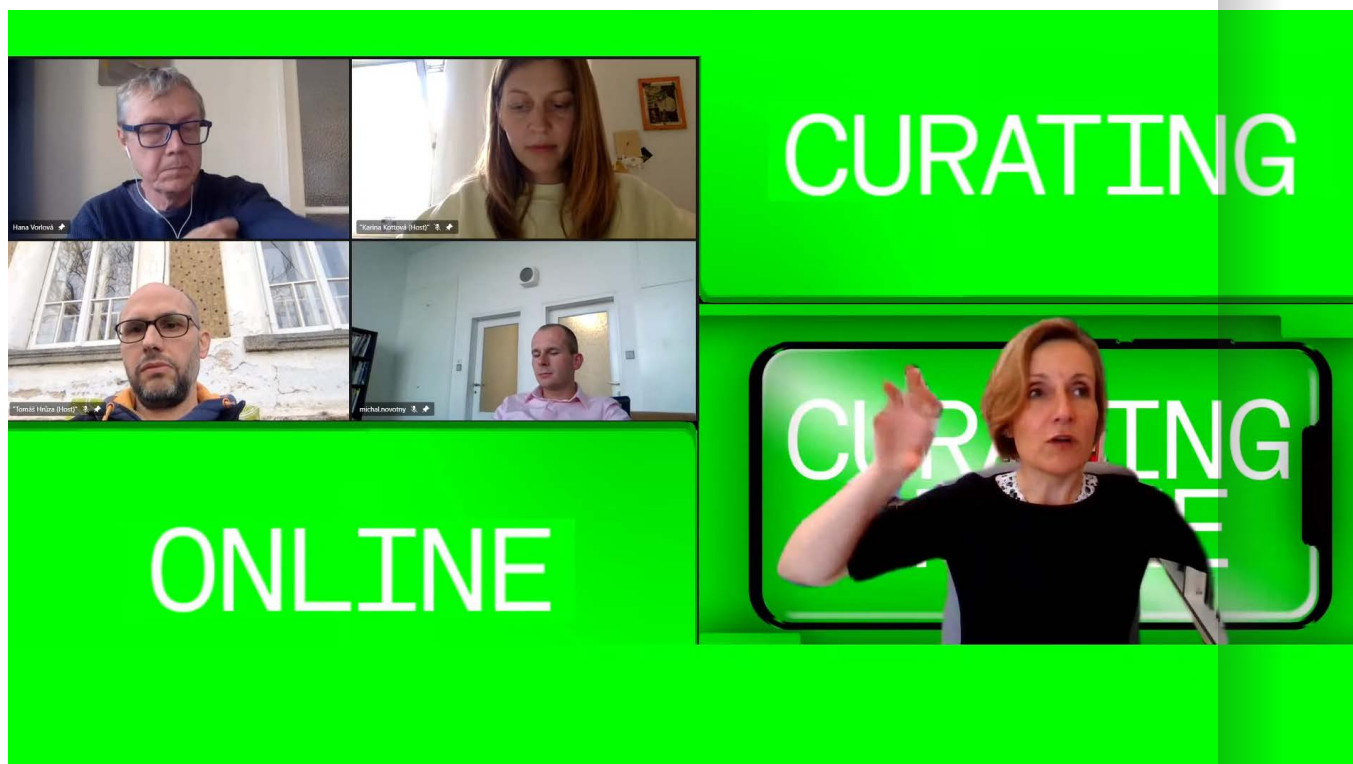
Figure 11, 12: Black Box. (2021). Round
table discussions chaired by Marika Kupková and
Monika Szűcsová during the symposiums *Curating
Online #1* and *Curating Online #2* Retrieved from
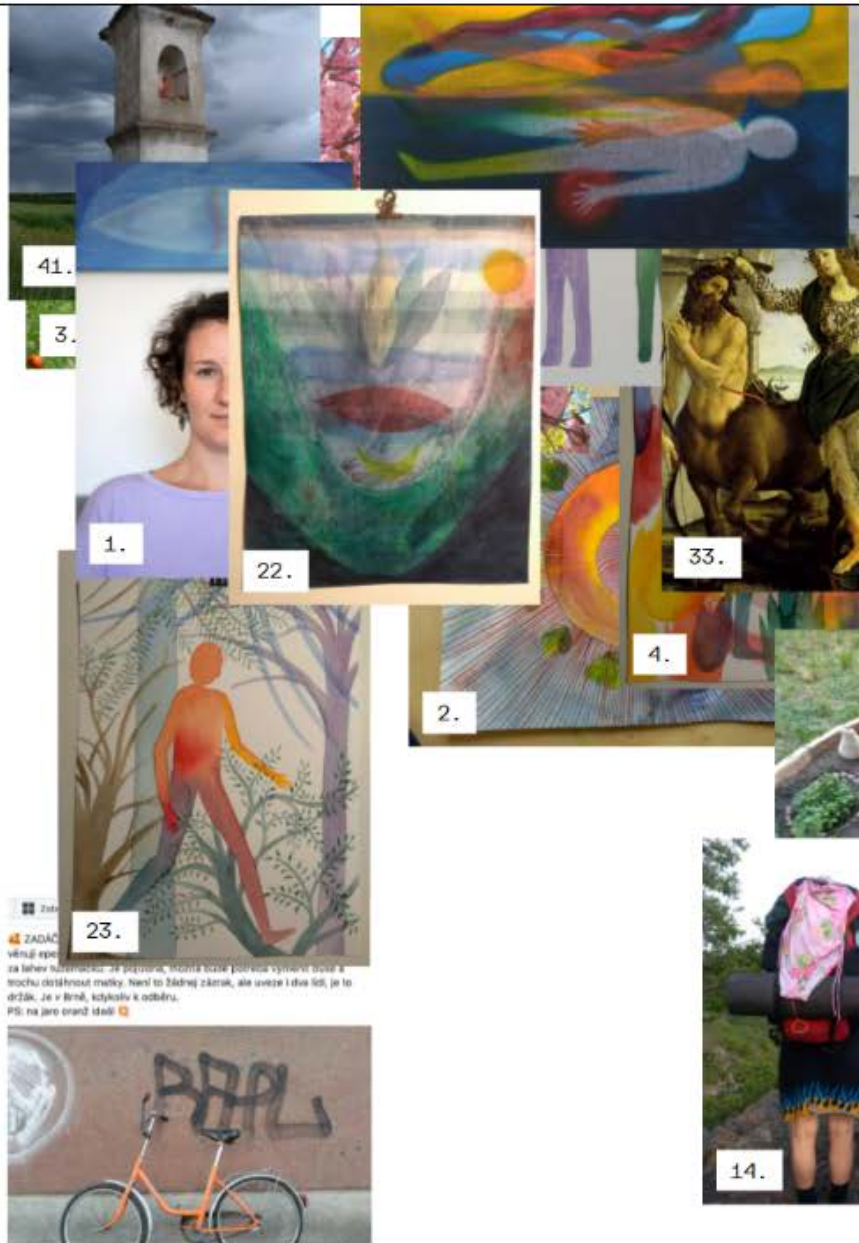https://cerna-skrinka.cz/symposium-1

has been, specifically in 2020, significantly affected by the closure of
museums and galleries. Alongside its existence as a curatorial project,
Black Box in the year 2021 facilitated a theoretical debate and analysis of
contemporary art with the participation of media art theorists, curators,
art galleries and festivals. Under the title *Curating Online*[22], a year-long
series of international online symposia on the transformation of art insti-
tutions due to the impact of the global pandemic Covid-19 was created,
articulating the transformation of curatorial models in the context of
the massive expansion of art production, distribution and presentation
into the online space. Attended by representatives of major national and
international museums, galleries and art festivals (Ars Electronica Linz,
WRO Wroclaw, Jindřich Chalupecký society, PLATO Ostrava, National
Gallery in Prague, Signal Praha, Sensorium Bratislava or PAF Olomouc,
among others), the symposia addressed the qualities and assumptions that
characterize the online presentation of art. Discussed were also changes
required in communication formats towards audiences accustomed to
the physical presence of art exhibitions or festivals; the specifics of cu-
rating on the web; critically confronted and evaluated were the strategies
of art mediation that traditional galleries and art festivals tested during
the 2020 lockdown.

Through various experts` presentations during the symposia, **Black
Box** contributed to the discourse on the organizational and conceptual
apparatuses of the art world (the museum, the gallery, the production
framework of the exhibition, the personality of the artist and the curator,
as well as the bodies active in the field of art and culture at the level of
the state), which is being shaped in the context of online art presentation,
web curation, and the diverse ways of transforming artistic aesthetics and
production. By holding the symposia online, the lectures have produced
recordings[23], which are archived on the Black Box website and which can
be used for further research and reflection on the current state of art and
cultural institutions, as well as art in general. Black Box as an archive can
be seen as a network of relationships, projects and events in the sense
proposed by Jussi Parikka (2009) when he argues that the function of
an archive is to organize and make visible the objects that are part of
our culture and to create hierarchical relationships between them. In this
context, Wolfgang Ernst (2009) draws attention to another significant

22 Black Box. (2021). *Curating Online #1: Transformation of art institutions
into online modes. Loss of institutional aura?*, April 21st and 22nd, 2021.
Retrieved from https://cerna-skrinka.cz/symposium-1; Black Box. (2021).
*Curating Online #2: The show goes on? Media art festivals during COVID
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cz/symposium-2; Black Box. (2021). *Curating Online #3: Cultural heritage,
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um-3

23 Black Box (2020 -). Curating Online Symposium (1, 2, and 3).
Retrieved from https://cerna-skrinka.cz/symposium-1

EN

31. život v karanténě, archiv autorky, 2020

32. život v karanténě, archiv autorky, 2020

33. Ticha, archiv autorky, 2020

34. projekt "Ticha", archiv autorky, 2020

35. život v karanténě, archiv autorky, 2020

36. život v karanténě, archiv autorky, 2020

37. život v karanténě, archiv autorky, 2020

38. život v karanténě,

Markéta Filipová

O PROJEKTU

KURÁTOŘI

TEORIE

KURÁTOR 01: PŘEŽIJÍ JEN UMĚLCI

KURÁTOR 02: NOVÝ ARCHIVÁŘ

Figure 13: Black Box (2020 -). Print screen of the project´s online archive. Retrieved from www.cerna-skrinka.cz

fact, which is the creation of relationships between given objects through hyperlinks. This suggests that the main function of a digital archive is not to document and preserve the content of each individual object but to create relationships between them. Black Box as an archive, in contrast to the archive as a space of the past, preserving collective historical memory, is an archive of the type of a 'flexible system', where the content is constantly recontextualised.

On this platform, the selected works represent an online exhibition or a collection of artworks, subjected to the curatorial selection of a human actor-curator (Curator 01: Only Artists will Survive) on the one hand, and at the same time subjected to the experimentation of a non-human actor-curator, which is an artificial neural network (Curator 02: A New Archivist)[24]. **Black Box** is an archive in motion or a 'living archive' that is synonymous with openness, creativity and the possibility of collaboration on its content. (Lehner, 2014, p.77) Archives of this type *"are not designed for long-term storage and memory, but for reproduction, for endless circulation between different levels, people, networks and locations."* (Dekker (ed.), 2017, p. 17)

Dekker's (2018) method of the 'network of care' that she finds useful when considering a conservation approach to net art, is also borrowed here to describe the community-based approach involving multiple actors when it comes to the curatorial project **Black Box**. In addition to the requirements for a *"transdisciplinary attitude"*, an operational *"transmission of information"*, and more, Dekker stresses *"collectivity in networks"* in the context of net art conservation. (Dekker, 2018, p. 89) This method of a collective approach to shaping artistic production and distribution, appears to be one useful strategy to examine the cultural institution as an important actor in shaping contemporary social realities in the field of art and artistic operations. The collaborative process naturally influences the roles of the curator, the artist, the audience and ultimately, the institution. The **Black Box** curatorial project can be seen as close to such a collective practice. It embodies the network of human and technological relations within which the project itself and the resulting challenges and artistic realisations have emerged and are taking shape. It also exists as a collaborative model of cooperation, leading to both the presentation and archiving of artworks and knowledge, and the subsequent critical reflection on the state of contemporary art. As a consequence of its active role in the circulation of knowledge and the creation of interactions between the other actors of this vast network (not necessarily of digital nature), there is also a strengthening of social awareness and critical reflection of the art institution itself.

When a person is ill, the symptoms of their condition intensify their awareness of their body and the processes that occur within it. The pandemic experience had a similar effect on social structures, including institutions such as galleries. It forced them to completely acknowledge self-doubt and continuously reevaluate the significance of their own existence: to ask who and in what way they can meaningfully assist. To assess how the Covid experience has influenced artistic production, let us be patient and wait for a reflection possessing greater temporal distance and mental abstraction. It is premature to be "angry" at contemporary art, or rather its representatives, for remaining too lethargic in the face of an event as powerful as the pandemic (Magid, 2021). It is our turn now: historians, curators and critics, to try to examine contemporary art production honestly and thoroughly and not to base this assessment only on the trends present in the prominent and influential biennial shows, which are unable to respond quickly to the unexpected experiences and threats we are currently experiencing. And the *Black Box* is one such attempt.

Figure 14: Juliana Höschlová (2021). Photo Eva Rybářová for Black Box, 2021

24   Curators (2020). Black Box. Retrieved from https://cerna-skrinka.cz/curators

R E F E R E N C E S

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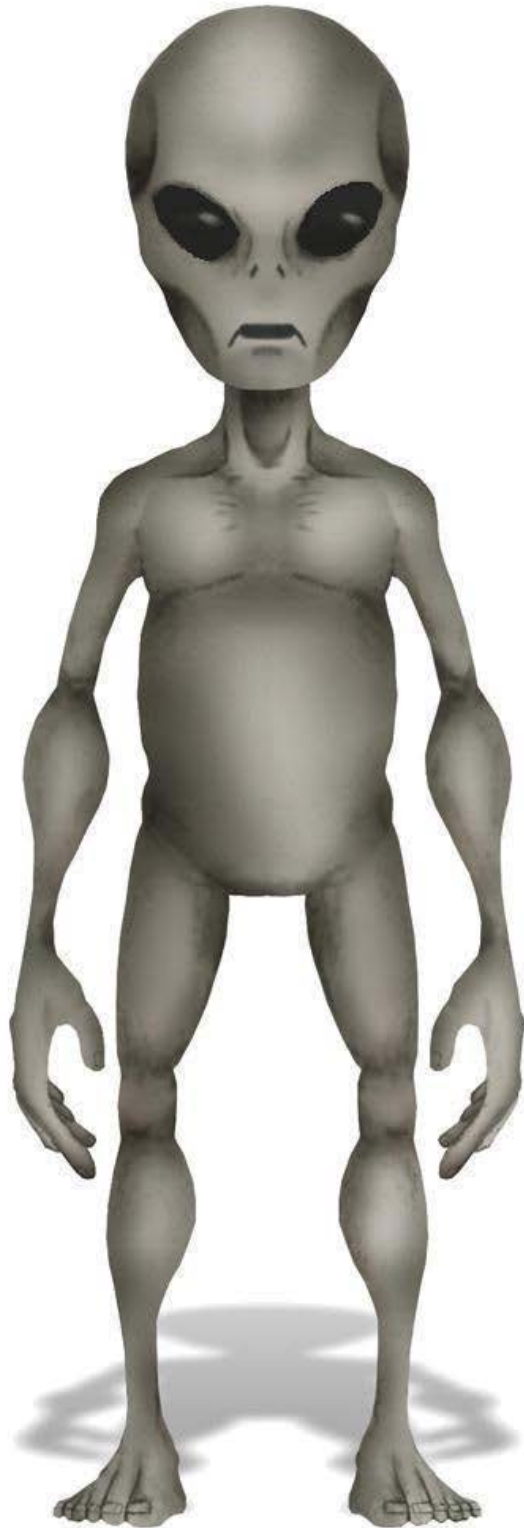Upstream Gallery Amsterdam. (2020). The New Outside. May 1–17, 2020. Curated by Constant Dullaart. Retrieved from https://www.upstreamgallery.nl/exhibitions/174/the-new-outside

THE NEW ARCHIVIST

JANA HORÁKOVÁ
ŠTĚPÁN MIKLÁNEK
PAVEL SIKORA

SUBVERSION AND A NEW VISION OF ARTIFICIAL INTELLIGENCE

"Let's not talk about chance (that's Cage and the 1960s), we're modeling a non-human curator from a neural network that was originally intended to be a 1:1 model of the human mind, ideally an extension and upgrade of it. I.e., the problem/topic is: To try to create something that makes decisions based on its own logic, independent of humans. But what is the actual logic of a machine system created by man? That's why we interfere in those processes, actually 'remove the human' from them, let the 'machine' be revealed."
(For Oliver, e-mail, Saturday, September 12, 2020, 12:10 pm)

The curatorial experiment **New Archivist** (*Nový archivář*) is a subversive gesture that addresses the current trends in the use of artificial intelligence in the field of art sciences and visual culture. While it is generally accepted that artificial intelligence has been used in recent years to process online databases of cultural heritage as a logical consequence and the 'next step' of large projects aimed at digitizing and making accessible the collections of memory institutions (such as **Google Art and Culture** or **Europeana** projects), in our project we work with a small dataset containing about 1000 images. While most projects based on the automatic classification of large datasets are framed by the endeavour to create tools for the accurate study of art and cultural history (**Digital Curator**, **Vasulka Live Archive**), our project was devoted to a subjective and artistic reflection on the experience of the Covid-19 pandemic, without the ambition to generate outputs with the general validity of a sociological probe. We emphasized the personal testimonies of the artists involved and experimented with ways of mediating these accounts through different interfaces and media, with a high degree of added value in the form of a personal interpretation of the collected digital traces of artistic existence. By taking this approach, we have been able to shift our attention away from the utilitarian use of artificial intelligence in the form of automated processing of big data following predetermined parameters, which also serve as indicators of the "truthfulness" and "correctness" of the outputs. Instead, our approach turns toward the intelligent tools themselves and how they materialise as a new actor in online curation to concentrate on exploring the logic and potentialities of contemporary artificial intelligence. Testing neural networks on a relatively small dataset (see the Dataset chapter) and using a variety of parameters (see the three experiments described below) allowed us to reach and perhaps transcend the limits of this technology, unmasking how it works while discovering unexpected assemblages in its liminal settings and failures, like the outcomes of the work of the non-human curator – the New Archivist or Alien Curator.

MOTIF: BLACK   BOX

The title of the online project **Black Box**, including the New Archivist, entails many meanings. It refers, for example, to the boxes stored in vehicles that record the course of a flight or journey and serve as a source of information in reconstructing mostly tragic events in the event of an accident or disaster. In our case, this meaning is fulfilled by the fact that the **Black Box** contains images that capture the experience of the global pandemic of Covid-19, as reflected by the group of artists based in the Czech Republic who participated in the project.

However, the black box is also used in sociology, psychology, and cybernetics to describe systems where the inputs and outputs are known; still, it is unclear how the outcomes were achieved. Artificial neural networks are also often referred to as black boxes because they perform complex recurrent processes outside the (human-visible) regime. (Berry, 2011, p. 15) Therefore, we consider the involvement of artificial intelligence in an exhibition project as a curator as another level on which the black box motif is developed, this time through the chosen medium and tool of manipulating the box´s contents.

## AI   AS   IN   ALIEN   INTELLIGENCE

"An image isn't only a technical reality: to have an image you need a scene, a myth, the imaginary." (Baudrillard, 1993, p. 30)

We tell a story with a typical sci-fi plot built on the myth of the cataclysmic end of humanity that features the curatorial intervention of an artificial intelligence probing into a dataset that consists of visual testimonies about the time of the Covid-19 pandemic hidden in our black box. The story is set in a future in which humanity has lost the battle against the pandemic of Covid-19. Humans have disappeared, and only traces of our civilization, represented by the contents of the black box, remain. This box is searched by a non-human intelligence – the New Archivist or Alien Intelligence, embodied by an artificial neural network.

The story is reminiscent of postmodern science fiction known as cyberpunk which emerged in the second half of the 20th century amid the cybernetic revolution associated with the rapid development of computing, computers, and artificial intelligence. Indeed, at the heart of the plot of our story is one of the key themes of this science fiction production, namely *"the question of control versus freedom, as it forces us to consider the extent we control or are controlled by the technology we wield"* (Telotte, 1995, p. 47)

In the framework of the current stage of development of intelligent systems, the question of who controls and who is controlled, who is the subject and who is merely the object of action has assumed particular urgency. There has been frequent talk recently of the threats associated with the use of artificial intelligence as a tool of distributed control over the inhabitants of cyberspace in the form of 'smart algorithms' that keep us trapped in our social bubbles. AI is presented as a severe threat to people working in a variety of industries, from truck drivers to teachers and doctors to journalists and graphic designers and many others, because it could put them out of work soon. And at the same time, the AI industry is creating new jobs that aren't talked about much, degrading the usefulness of human labour to mechanically tagging massive datasets for neural network learning at meagre wages, for example, using workers hired through a site run by Amazon, aptly named **Mechanical Turk**. Similarly troubling are the considerations of experts on the ethics of autonomous vehicles discussed under the label of the 'trolley dilemma' (e.g., Bonnefon, Shariff, Rahwan, 2019, p. 15), which posit mathematical solutions to situations in which a 'smart' car (currently hypothetical) chooses between killing one person in the car or five strangers.

During the Covid-19 pandemic, the inhumanity of AI reason also revealed itself substantially. Mapping the global spread of the virus, the evolution of the disease based on factors such as human migration, illness and death rates by age, population health and vaccine coverage, etc. (Kreuzhuber, Mar 19, 2020) But not only that, AI models were also used to predict the future behaviour of the virus, in addition to processing and visualizing data on the current state of the pandemic, and therefore realistically determining the next steps governments, health professionals and ordinary people could take to combat the viral contagion. Who was controlled by whom? Were humans maintaining the AI systems supposed to help them make decisions? Or were the AI systems controlling our next steps and therefore determining what we would do and how quarantine measures would be tightened or loosened?
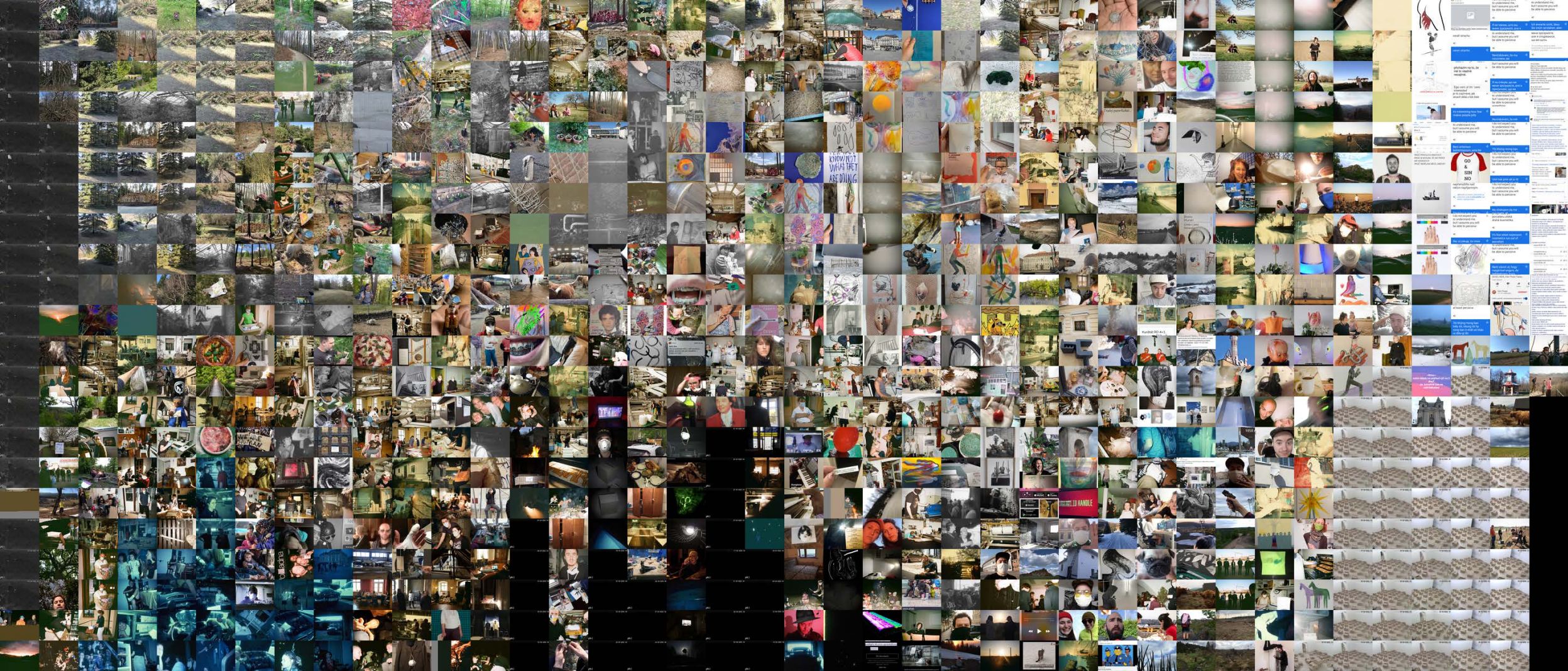
These representations of the pandemic have something terrifying to them because they are non-human in themselves. Benjamin Bratton named this 'something' as the fear that we will become invisible to intelligent machines, that they will not recognize us as significant entities in the set of phenomena captured by the apparatus of machine cognition:

"Seeing ourselves through the ´eyes´ of this machinic Other who does not and cannot have an affective sense of aesthetics is a kind of disenchantment. We are just stuff in the world for ´distributed machine cognition´ to look at and to make sense of." (…) *This uncomfortable recognition in the machine's mirror is a kind of 'reverse uncanny valley.' Instead being creeped out at how slightly inhuman the creature in the image appears, we are creeped out at how un-human we ourselves look through the creature's eyes. This is something to continue to research further, but in and out of ´art´.."* (Bratton, 2022)

Artificial intelligence, in the form of artificial neural networks, is a new non-human actor that has appeared on the world scene. It's both terrifying and fascinating simultaneously, fueling our imagination. And it does so all the more, the more unlike us it is, the more its Otherness manifests itself, independent of its creator and its preimage. Towards non-human intelligence is the direction we have also taken in our curatorial experiment.
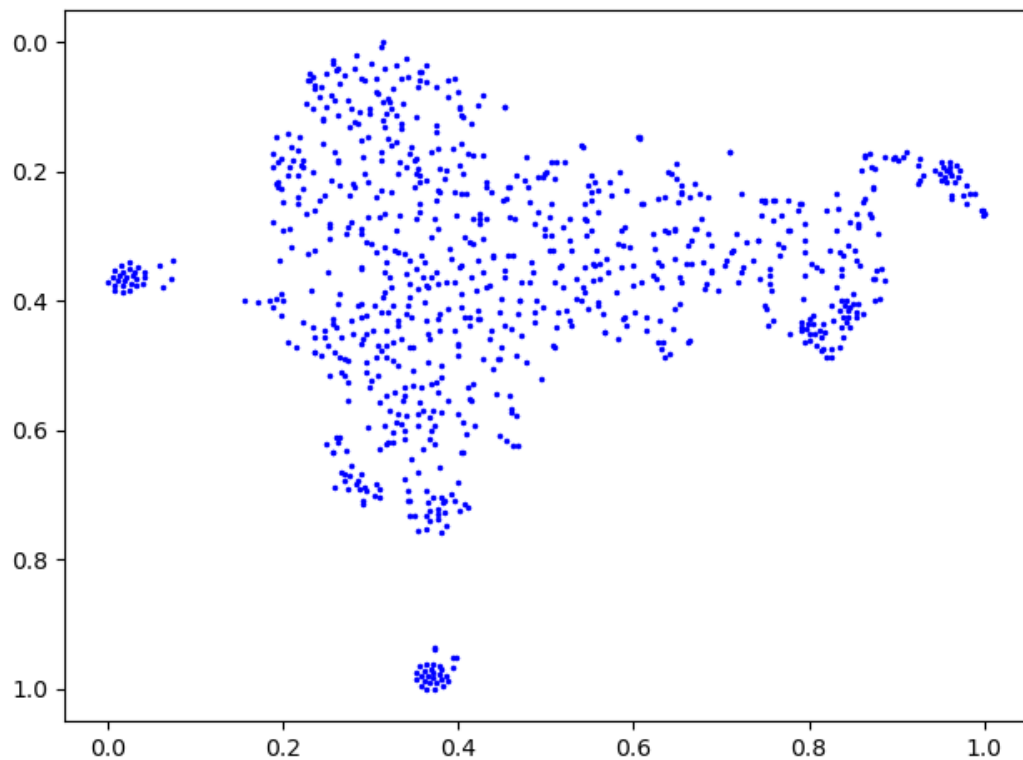
U N L E A S H I N G   A I

We named the curatorial experiment with the use of an artificial neural network the New Archivist to identify the figure of the change of perspective and method of working with archival material, which is characterized by the search for ways to go beyond the limitations and consequences of anthropocentric interpretation of the world within the framework of knowledge of the world.

> "A new archivist has been appointed. But has anyone actually appointed him? Is he not rather acting on his own instructions? Certain malevolent people say that he is the new representative of a structural technology or technocracy. (…) Some say that he is a shammer who cannot back himself up with reference to the sacred texts, and who seldom quotes the great philosophers. Others, though, claim that something radically new has appeared in philosophy, and that this work is as beautiful as those it challenges. It celebrates the dawn of a new age." (Delleuze, 1999, p. 3)

The new archivist is the name given to an artificial neural network in the role of a curator who deals with the contents of a black box without knowing the code in which it is written and unaware of the situation in which it was created. We wondered what leitmotifs the AI would recognize in the visual evidence of our experience of the Covid-19 pandemic if we kept inputs in the form of parameter specifications and objects to be searched for to a minimum. Therefore, we have chosen an unsupervised learning method (unsupervised learning).[1] Such an intelligent tool resembles a linguist who has discovered an unknown language or an extraterrestrial (Alien) who has picked up unidentified signals from planet Earth. Like them, it searches the unstructured cluster of particles for repeating symbols and patterns of their arrangement to decipher the sign system and reconstruct the meaning of the box's contents.

DATASET

The primary condition for the effective use of artificial neural networks is the preparation of a sufficiently large dataset. In our case, however, we had only a few dozen text and image records of selected art projects at the beginning of the project. Therefore, we again contacted the artists to get them involved and asked them to send us additional documentary material on their projects, but also images capturing their everyday life during the quarantine restrictions, such as screenshots of text messages from mobile phones or other visual signs of mediated communication and situations they were experiencing. This way, we were able to collect approximately 1 000 images. In addition to extended documentation of selected art projects, we collected images capturing secret parties of students stuck in dorms and student-shared apartments, scenes from the home environment of young families with young children, photos from trips to the countryside, selfies from family car trips, as well as stacks of books read, views from the window, lists of favourite podcasts on mobile phones, and snippets of Messenger communications. All images were given the names of the artists and a brief description (name of the artist, title of the work or identification of the image, date taken), but not for the sake of the instructions for the neural network, but for our better orientation in the output of the AI work, and their placement in the Archive section of the website. (Figure 4)

1   GHAHRAMANI, Zoubin: Unsupervised Learning. BOUSQUET, Olivier, Ulrike VON LUXBURG a Gunnar RÄTSCH, ed. Advanced Lectures on Machine Learning [online]. Berlin, Heidelberg: Springer Berlin Heidelberg, 2004, s. 72-112 [cit. 2020-12-21]. Lecture Notes in Computer Science. ISBN 978-3-540-23122-6. Dostupné z: doi:10.1007/978-3-540-28650-9_5
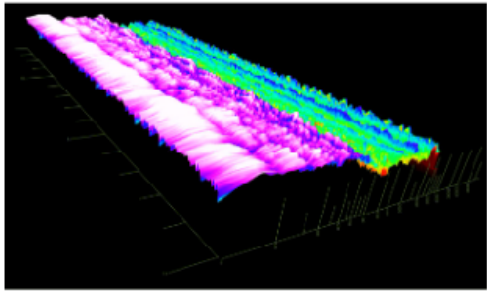
Figure 4: Černá skříňka / The Black Box: The Archive section. Print screen. Accessed December 12, 2022. Retrieved from https://cerna-skrinka.cz/list

cerna-skrinka.cz/list

ČERNÁ SKŘÍŇKA / BLACK BOX   EN

O PROJEKTU

JMÉNO	MATERIÁL
Ladislav Mirvald	život v karanténě, archiv autora, 2020
Markéta Filipová	projekt "Ticha", archiv autorky, 2020
Vojtěch Kundrát	život v karanténě, archiv autora, 2020
Ondřej Homola	život v karanténě, archiv autora, 2020
Juliana Höschlová	život v karanténě, archiv autorky, 2020
Ladislav Mirvald	portrét
Johana Merta	Noboj se a neplač / Johana Merta / vernisáž 12. 5. 2021 / 12. 5. 2021 - 28. 6. 2021 / Fasáda Galerie TIC, Radnická 4, Brno
Ondřej Homola	
Johana Merta	život v karanténě, archiv autorky, 2020
Markéta Filipová	Klan dvou koní / Markéta Filipová / 2. 2. 2021, 16. 2. 2021, 2. 3. 2021 - 23. 3. 2021 / Fasáda Galerie TIC, Radnická 4, Brno
Markéta Filipová	Klan dvou koní / Markéta Filipová / 2. 2. 2021, 16. 2. 2021, 2. 3. 2021 - 23. 3. 2021 / Fasáda Galerie TIC, Radnická 4, Brno
Polina Davydenko	život v karanténě, archiv autorky, 2020
Markéta Filipová	Klan dvou koní / Markéta Filipová / 2. 2. 2021, 16. 2. 2021, 2. 3. 2021 - 23. 3. 2021 / Fasáda Galerie TIC, Radnická 4, Brno

KURÁTOR 01: PŘEŽIJÍ JEN UMĚLCI

KURÁTOŘI

KURÁTOR 02: NOVÝ ARCHIVÁŘ

TEORIE

CURATING ONLINE / SYMPOZIUM

DISTANT READING

Artificial neural networks are a subcategory of machine learning, one of the most progressive disciplines in artificial intelligence today. In our case, we use artificial neural networks as a tool of the distant reading method, which is suitable for exploring cultural phenomena at the scale of big data.[2] This approach provides knowledge based on quantifying the occurrence of specific parameters of the studied set of traits and their processing with the help of statistical methods and probability theory. The outputs of neural network processes can be used in distant reading to support the exact interpretation of cultural phenomena through categories such as clusters of phenomena, density or, conversely, sparsity of occurrence within discursive formations. Moreover, they allow us to free ourselves from the expectations, preconceptions and emotional projections that form a natural part of our interpretation of the world and thus to view the traces of the global pandemic from an anaesthetic distance – from the outside, from the perspective of a non-human actor and observer.

UNSUPERVISED LEARNING

We wanted to reinforce this non-human view as much as possible in the project, thus developing the black box motif associated with a post-apocalyptic vision of the end of the human world and the rise of non-human intelligence (artificial or virus intelligence?). To predict the results, we used methods falling into the category of unsupervised learning. This is an area of machine learning called learning without supervision, which is used to search for unspecified patterns in a dataset that is not provided with predefined metadata and minimal assistance from a programmer. In the case of the **Black Box** project, this involves machine sorting of image material into groups (clustering). The neural network was used to extract unique fingerprints from the image material; the subsequent sorting into groups was performed using unsupervised learning algorithms that operate based on distance metrics (Euclidean distance and others). With this combination, we created a semi-supervised algorithm. The Python programming language enabled easy implementation of available machine and deep learning modules. The input to the neural network was visual material of colour images collected from selected artists.

2   Franco Moretti, who is thought to have coined the term distant reading, first used it in an article Conjectures on World Literature. *New left Review*, January/February 2000. Available online: https://newleftreview.org/issues/ii1/articles/franco-moretti-conjectures-on-world-literature (cit. 19. 12. 2022.)
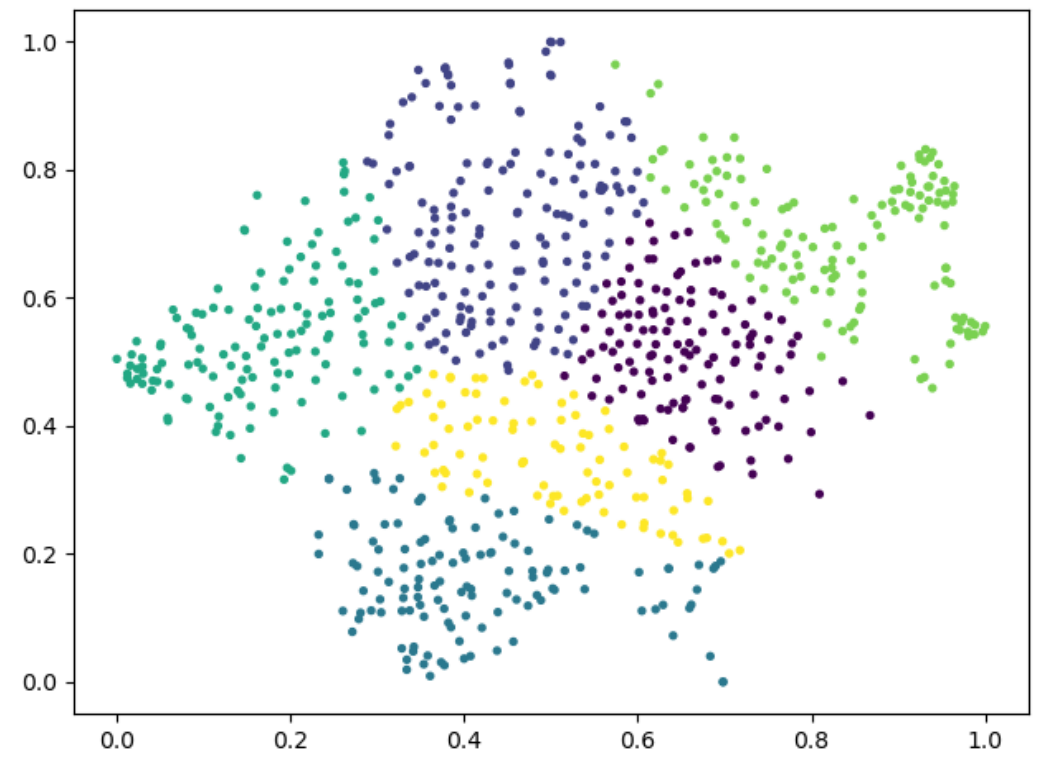
Figure 5: Clusters produced by applying the Mean Shift algorithm to the reduced image parameters obtained by t-SNE. Author: Štěpán Miklánek

THREE ATTEMPTS TO RID ARTIFICIAL INTELLIGENCE OF THE HUMAN EXPERIENCE

ATTEMPT 1: THE POWER OF COLOR

In the first experiment, the already trained Xception network model, which is part of the freely available Keras module (Chollet and others, 2015) for Python, was used to extract features from the image data. (Chollet et al, 2017) In this case, it was software with trained weights on the ImageNet dataset, one of the largest databases of manually annotated image material, comprising more than 14 million digital images. (Deng et al., 2009) The colour representations of the images, given by the R, G, and B channels (red, green, blue), were chosen as the primary criterion for classifying the dataset's contents. The features representing the unique fingerprint of each image were extracted using a neural network. These features were then converted into numerical vectors. The next step was to reduce the number of dimensions of the vectors to just two dimensions, i.e., two numerical values representing the location of the corresponding image in space. For this purpose, the t-SNE (T-distributed Stochastic Neighbor

Figure 6: Image output of attempt 1
– Visualization of image similarity using t-SNE algorithm.
Author: Štěpán Miklánek

Embedding) algorithm was chosen, allowing the reduction of numerical vectors to points in a two- or three-dimensional space. (Pouyet, 2018) This way, each of the input images was given a precise location on a map of the similarity-difference relations between the images in the dataset in the form of two coordinates. This metadata subsequently determined the location of the image on the similarity map (Figure 6), which was the product of this experiment.

However, it turned out that the colour parameter as the dominant criterion for dataset classification is not suitable for our purposes. Artists often submitted images that were similar in colour, naturally, as they were taken in the same or similar environment or additionally modified with the same filter. As an outcome, the first experiment's results showed high accuracy in classifying images according to the creators without equipping the neural networks with a model of the authors' handwriting or characteristic motifs. On the one hand, in this case, the artificial neural network proved to achieve high accuracy in sorting the dataset according to authors based on minimal input information (in our case, the dataset was sorted according to a single criterion – the colour spectrum used). However, for our purposes, this proved to be unsatisfactory, as we wanted the non-human (alien) curator to look for recurring motifs across the dataset.

ATTEMPT 2: COMMON SENSE

Considering the results of the first experiment, a method of content analysis of the dataset was chosen, which suppresses the value of the colour of the images by converting them into grayscale. Thus, the images were represented by only one channel, with the values of each pixel indicating the grayscale. The features were extracted from the images and thus modified in the same way as in the first experiment, and again dimensionality reduction followed. The goal was to program the software to classify the dataset into unspecified categories automatically. For this purpose, several commonly used clustering algorithms were tested, which work on the principle of comparing distances between points in the plane, focusing on finding separate clusters within the spatial projection of the dataset. Figure 7 shows the output of the Mean Shift algorithm (Jin et al., 2017, p. 806–808), which we evaluated as the most suitable for our purposes.

In this case, the artificial neural networks classified the dataset according to thematic headings with greater or lesser accuracy across the supplied digital image sets. However, we were still working with neu-

ral networks pre-trained on a freely available image dataset (ImageNet) containing images aggregated from photo-sharing sites (Flickr.com, etc.), thus significantly weakening the software's credibility as a non-human entity. The software functioned as a tool to search for relationships between the images from the coronavirus pandemic collected in our **Black box** and the images from ImageNet. Since the **Black Box** dataset is tiny compared to ImageNet, the neural networks placed more emphasis on those visual features identical to ImageNet content when sorting our dataset. As a result, the arrangement of the photographs remained largely the same, allowing people, for instance, to mistake selfie images with and without a mask. When sorting the images, this made the layout of them a more critical factor than the mask itself, the quarantine symbol. In this context, the pandemic experience appeared as a banal episode floating on the surface of the ocean of the visual overproduction of contemporary visual culture.

Figure 7: Thematic clusters obtained by extracting image parameters using a pre-trained neural network and the Mean Shift algorithm. Author: Štěpán Miklánek
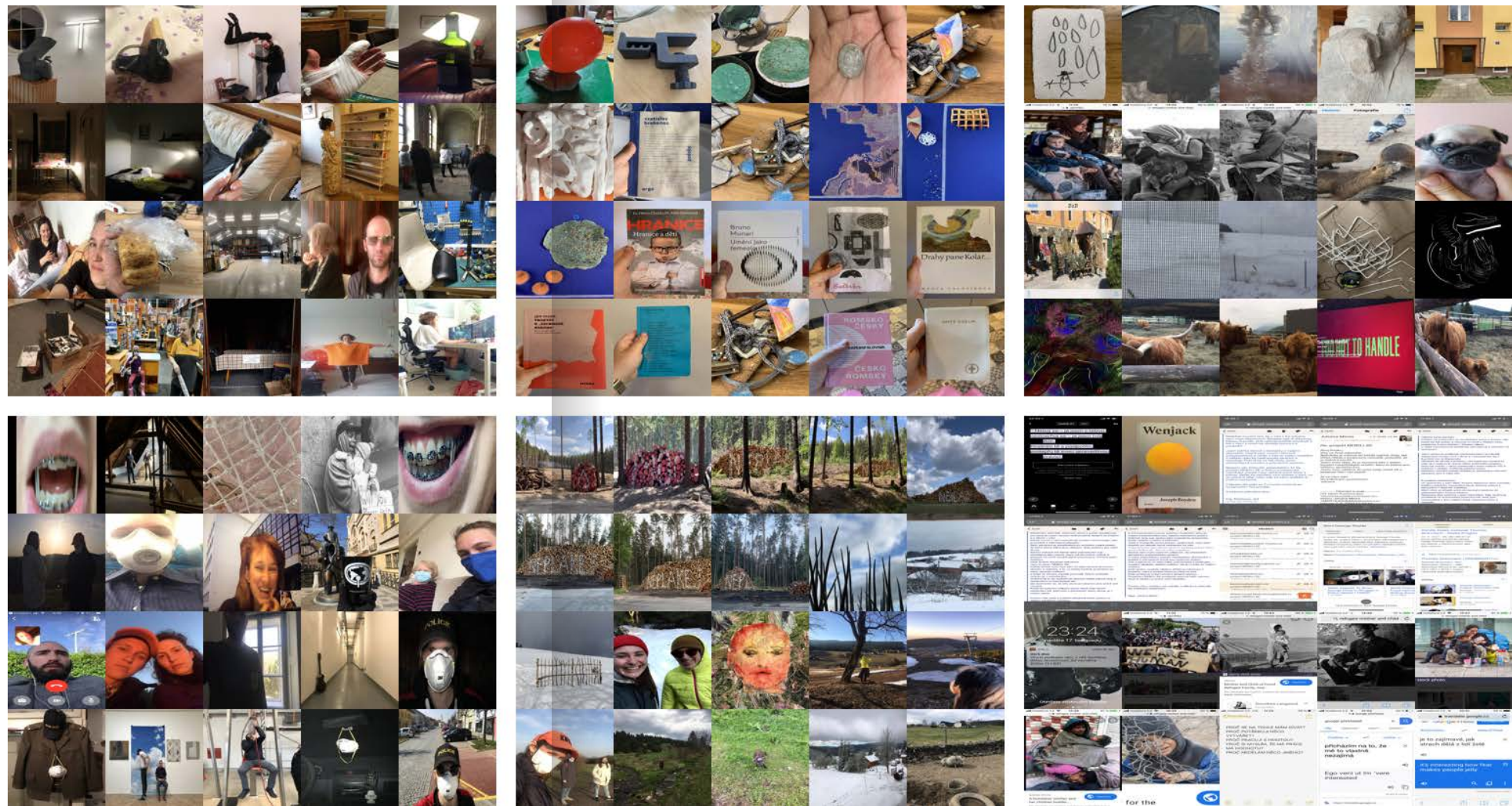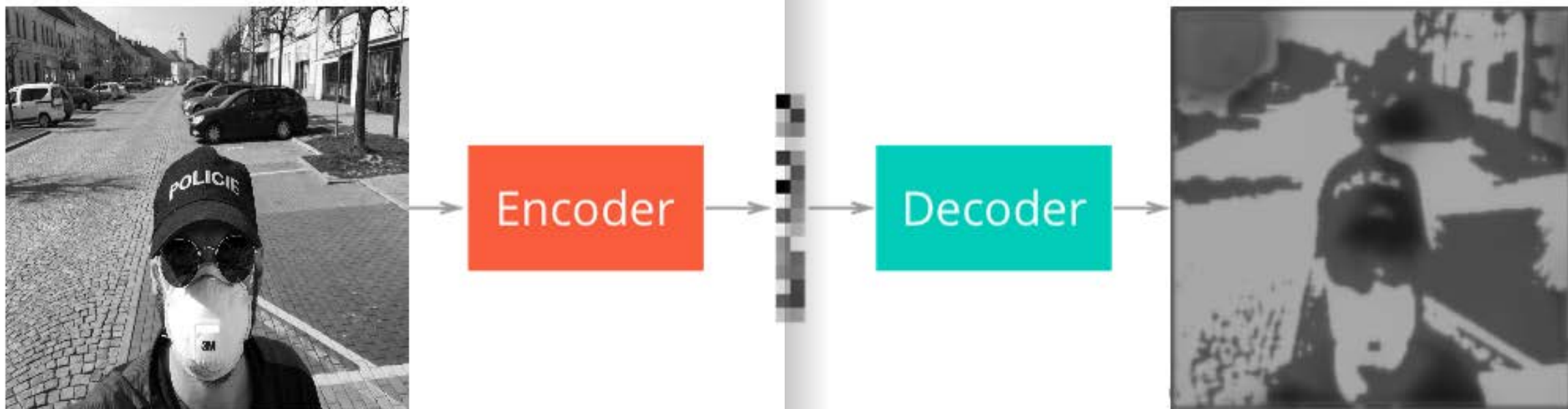
ATTEMPT 3: ALIEN CURATOR

In the third experiment, a neural network that was not pre-trained on any visual dataset was used. This type of neural network is referred to as an autoencoder (Hartman & Mestha, 2017). This neural network architecture is used for dimensionality reduction. The task of the autoencoder is to approximate the function between the input and output datasets. This architecture is divided into two sides i.e., encoder and decoder. The first block (encoder) reduces the image input into a simplified representation so that the original image can be reconstructed from this representation. The second block (decoder) is used to reconstruct the original image back from the simplified representation of the original digital image. In this process, the neural network reduces the visual data of the original image into a simplified representation that captures the characteristic parameters of the image. (Figure 8) The output of the encoder was then used as input to the clustering algorithm. (Hinton, 2006) The decoder was only used in the training process to verify the reduced visual data. As in the previous case, the Mean Shift algorithm was used at this stage. The result was the classification of the image dataset into thematic groups using machine learning based on the recognized similarities derived solely from the machine analysis of the respective dataset.

In this experiment, we were able to come closest to what we think of as an **alien curator**, as we minimized the contact of the developed neural network with human-generated inputs or decisions, whether in the form of a metadata-laden dataset created by humans, such as the aforementioned ImageNet, or by programmers of a predefined number of clusters or other parameters to guide the software's performance. As the dataset expands and changes in the future, the neural network will also evolve, which may cause, for example, changes in the number of clusters (thematic groups) of recognized objects.

The clusters of images the neural network has evaluated as similar to each other contain images that, from our point of view, are quite heterogeneous, often showing no common denominator, a shared element, whether in the form of an object or composition. We can only guess what parameters were taken into account when classifying them. We are thus confronted with a non-human entity and its calculating logic that performs the visual analysis of the image traces of the coronavirus pandemic.
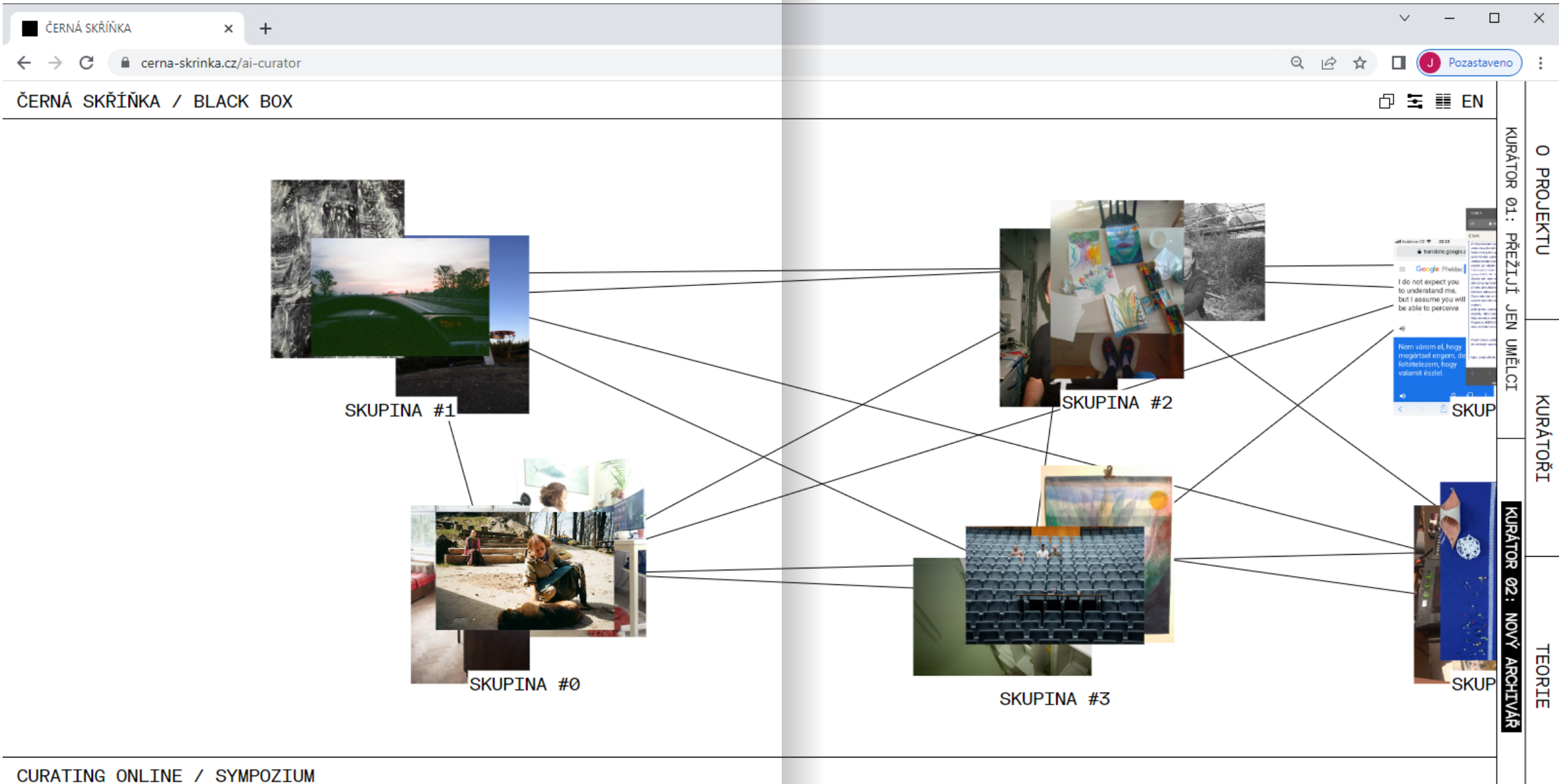
Figure 9: Sample of the work of the New Archivist (Alien AI). Print screen of the page generated on 17 December 2022, 5:10 pm. Retrieved from https://cerna-skrinka.cz/ai-curator

CONCLUSION – ALIEN ARCHIVIST (ALIEN AI)

While usually, the structure of a database or archive is assumed based on a thorough acquaintance with the material to be organized, in our project, we did the opposite. The new curator (software) is programmed so that the structure of the database gradually changes in response to the expanding and changing content. Also, the output in the form of a set of image clusters and a visualization map depicting the leitmotifs of our collective experience of the pandemic will gradually transform with respect to the interaction of the dataset content with the neural network. This is thus a fulfilment of the concept of a live archive not only in the sense of a gradually growing dataset but also in the neural network's ability to evolve and, consequently, restructure the arrangement of outputs.

In the introduction, we used a quote in which Gilles Deleuze recalls Michel Foucault's accusation of technocratic structuralism. Our curatorial experiment suggests that the metaphor of a new Foucaultian-type archivist can be extended to refer to the use of artificial intelligence in working with datasets, i.e., the technically supported practice of "structuralism without structures," in the case of the use of neural networks and the method of learning without supervision. Indeed, an artificial neural network is just such a flexible structure. Its operational logic can be described as moving towards a transgression of the boundaries it permanently sets and overcomes. The resulting composition and assemblage of images stored in a black box change over time as the territory it maps evolves and changes (Dreyfus – Rabinow, 1982, 1983).

While artificial neural networks are usually used to test preconceived theories of art history, epochs, and styles (Spratt, 2018) (Elgammal et al., 2018), in our project, they were used in an experiment whose aim was not to verify the validity of generally accepted claims but to discover a new perspective on art in a global coronavirus pandemic that goes beyond human experience and existing knowledge. The aim was to bring to life the inhuman nature of the system, to provoke it to behave unpredictably and to place the traces of the pandemic in a post-apocalyptic story of humanity's demise.

This goal is a critique of the anthropocentrism of the discipline of artificial intelligence as such. But it is also a rejection of the positivist ethos that is manifested in the current tendency to use automated procedures in processing big data in the form of digitized cultural heritage collections. The software we have created is not an extension of human senses or cognitive processes in the sense of an artificial imitation of them. Still, we have attempted to fulfil the concept of non-human artificial intelligence. The question is whether this process leads only to the entropy of the system or has the potential to become an instrument of affirmation of the Other, the non-human, the transcending human, as part of the world we inhabit.

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22, 70.75

-8.9575, -3.6531

123, 69.75

8.745, 3.4736

-6.6242, 3.2359

131, 31.25

7.6004, -4.229

WEB IS THE *KEY* *DESIGN* OF BLACK BOX

ALINA MATĚJOVÁ
OLIVER STAŠA

CONCEPTUAL BACKGROUND

The Black Box / Černá skříňka project was a challenge in terms of the circumstances in which it was created, its thematic focus, and its design. During the Covid-19 pandemic, external circumstances in the form of recurrent and lengthy lockdowns necessitated the usage of the internet environment for communication among the creative team as well as the public presentation of the project's outputs. It was therefore, clear, from the beginning that the project would be presented on a specially designed website. However, the website's layout, UX design, and visual conception had not yet been decided.

The website's graphic designer, Alina Matějová, began by analyzing the task, which involved defining fundamental terms and concepts and the imaginary boundaries and driving forces for the web design. During the team's first brainstorming sessions, it was clear that the goal would not be to bring the physical gallery space online literally. Instead, we focused on leveraging the specific nature of online curating and were inspired by the characteristics of the World Wide Web and the properties of programmed digital media in designing the site. *"Archive, data collection, new curator, adaptation, rawness of materials, online environment, long-term development, association, connection, network."* These concepts have shaped our thinking about the design of the web.

HYPERTEXT: STRUCTURE THROUGH VISUAL LANGUAGE

Then, we inquired about the specifics of the online environment in terms of information organization and how we could apply them to the design of a website that will serve as an interface to a digital archive containing documentation of selected art projects reflecting the experience of the Covid-19 pandemic. Our search led us, among other things, to the hypertext scheme that Theodor Holm Nelson had been working on since 1960 as part of the **Xanadu** project (Figure 1) (Nelson, 1960, https://www.xanadu.net/). Nelson's proposed rhizomatic structure for organizing information is generally considered to be a precursor to the current form of the World Wide Web and an elaboration of an idea by Vannevar Bush, who designed a device called **Memex**, which was intended to be a technical extension of human memory (Bush, 1945). The schema created by Nelson (Figure 1) depicts a non-hierarchical structure consisting of blocks of information (called lexies) distributed in space and connected by electronic paths (links) to provide users with the possibility of non-linear keyword-based search among the information stored in this respective manner.
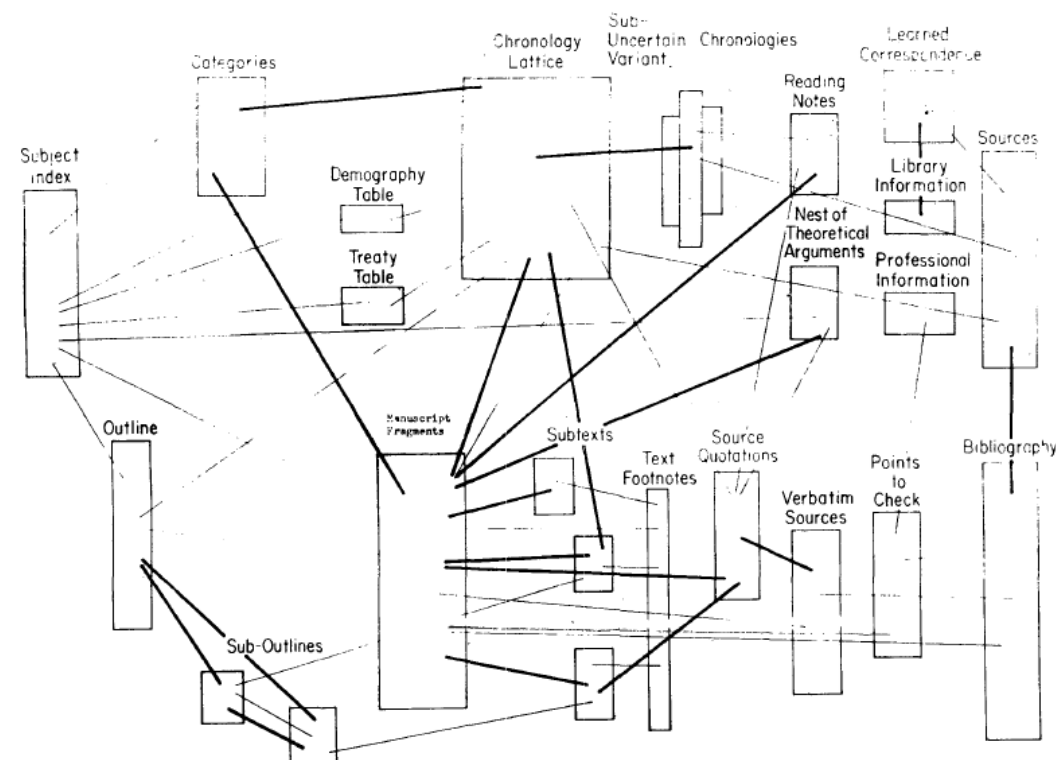
FIGURE 1—ELF's capacity for total filing: hypothetical use by historian. Thin lines indicate links; heavy rules indicate some of same entries.

Figure 1: A panoramic view of postulated hypertext from Ted Nelson's 1965 paper on the subject. Retrieved from https://www.notion.so/blog/ted-nelson

Referring to the aesthetics of technical drawings or drafts, the fundamental components of web design are hypertext arrangements and schematic visualizations of the relationships between the various pieces in the online archive. The acknowledgement of the hypertextual structure of the web at the visible level of the user interface has become a fundamental means of expression while challenging web users to read non-linearly, to follow free associations as they navigate through its content, and to link items in unforeseen arrangements.

The principle of an open structure is emphasized on the web by the fact that each time the page is loaded, its layout changes, as the individual clusters of information related to the works of specific artists are rearranged each time into a new constellation, representing a different chain of associations and network of relationships. In this way, the database's architecture and the web's visual language have been brought together into an inseparable whole, in which the symbolic and structural levels merge and are inseparable from each other.

Tomáš Moravanský

Johana Merta

Vojtěch Kundrát

Markéta Fil

ld

Ondřej Homola

Juliana Höschlová

Polina Davydenko

O PROJEKTU

KURÁTOR 01: PŘEŽIJÍ JEN UMĚLCI

KURÁTOŘI

KURÁTOR 02: NOVÝ ARCHIVÁŘ

TEORIE
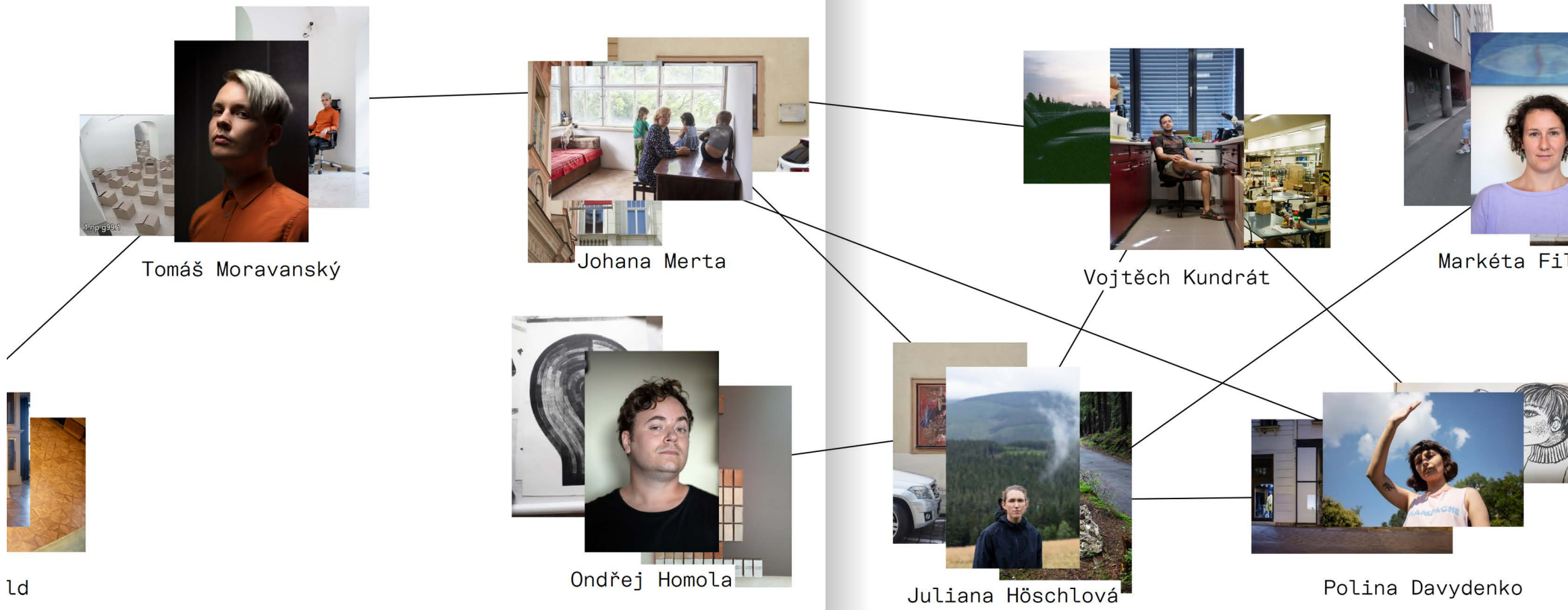
Figure 2: Black Box (2020).
Homepage of the project. Retrieved
from https://cerna-skrinka.cz/

SKUPINA #1

KURÁTOŘI

SKUPINA #5

O PROJEKTU

→

TEORIE

KURÁTOR 02: NOVÝ ARCHIVÁŘ

Organizačním principem druhého projektu je autorský objekt v podobě umělé inteligence, která interpretuje shromážděný materiál z objektivní, ne-lidské perspektivy. Tento umělý kurátor se zabývá obsahem černé skříňky, aniž by znal kód, v němž je zapsán, a bez povědomí o situaci, v níž vznikl. Podobá se lingvistovi, který objevil neznámý jazyk, nebo mimozemšťanovi, který zachytil neidentifikovatelné signály z planety Země – hledá v nestrukturovaném shluku částic opakující se symboly a zákonitosti jejich uspořádání, aby bylschopen rozluštit znakový systém a rekonstruovat význam obsahu skříňky. Jaké leitmotivy tento nelidský organismus rozpozná ve vizuálních stopách naší zkušenosti s pandemií covidu-19?

NOVÝ ARCHIVÁŘ

Ve městě byl jmenován nový archivář. Ale byl skutečně někým jmenován? Nepracuje spíš podle svých vlastních instrukcí? Zlovolní lidé tvrdí, že je novým reprezentantem technologie,strukturální technokracie. (...) Další tvrdí, že je podvodník, který se nemůže opřít o žádný posvěcený text a který vůbec necituje velké filozofy. Ale jsou naopak i lidé, kteří prohlašují, že se ve filozofii zrodilo něco nového, něco radikálně nového, a že toto dílo má krásu toho, co odmítá: svítání nové doby.

DELEUZE, Gilles. Foucault. Praha: Hermann & synové, 2003, s. 11.

DISTANT ~~READING~~

ARCHIVE: FK GROTESK MONOSPACE

Another graphic element of the website are the pull-out tabs inspired by cataloguing tickets, which are used in physical archives to organize metadata records about stored archival materials. The aesthetics of catalogue labels is also incorporated into the website's visual appearance in the choice of the *FK Grotesk Monospace* font, whose design is reminiscent of technical archival records. The website's visual appearance was based on working with this font in different variations. The graphic designer designed different font sizes for different levels of the site and set the writing style in lower or upper case. The black technical font on a white background resembles a technical drawing showing the relationships between stored items while evoking the environment of an archive, especially its technical background in the form of austere, systematically arranged filing cabinets. However, the inspiration for the physical archive was only a starting point for thinking about the current forms of archives on the web and digital environment. It manifested in how information was sorted into folders, the numbering of items, or the alphabetical lists of works stored on the web.

Figure 3: Black Box (2020). Detail of pull-out bases. Retrieved from https://cerna-skrinka.cz/curators

The textual content on the website is stored on several sliding pages, uncharacteristically placed horizontally on the right side of the website, where they peek out like paper cards from an open file drawer. The web user can click on them to expand them to cover the whole computer screen and read their contents.

There are numerous pull-out tabs on the website's homepage (https://cerna-skrinka.cz/): About, Curators, and Theory. Then there are the Curator 01 and Curator 02 tabs, which detail the two methods used to manage the digital archive. In later phases of the project, tabs for the Curating Online symposia series were added to the website's footer bar. Most recently, a bookmark was added to the site for the book you are currently reading.

The functional features for user navigation and control of the website were likewise designed with a minimalist aesthetic. They consist only of an arrow symbol, which, depending on the location and situation, performs

functions such as opening/closing, and zooming in/out. To avoid being overshadowed by the spectacular graphic design, this modest design concept highlights the content. However, the minimalist visual layout is offset by the original design of the site's functional features. Loading pages, drawing in and out tabs, expanding artist information, etc., are programmed to draw attention to themselves as a performance of a programmed medium encoded in the code of a programming language.

T H E   B O X

Another challenge for the designers was the concept of an archive documenting each artist's artworks, activities and lives. With the Black Box archive filled with items ranging from photographs taken by professional photographers to print screenshots? of Messenger conversations, it was not easy to find the key to arranging them in a unified way. The folders on the team's Google Drive were more like an assemblage of various records and images, connecting the art world with the everyday life of artists. The principle of blending everyday life with artistic creation evoked the so-called Fluxus Boxes, which members of the Fluxus movement created.

> *"Fluxus boxes were a peculiar form of expression in which the artist gathered a series of objects, cards, materials and components and assembled them in boxes, suitcases or other containers. The assemblage was created with multiple purposes in mind: creating suggestions and tangible poetics by juxtaposing things was something that the cinematographic montage had learned since the beginning of the century, and it was also explored by musicians such as Cage, where the sounds of known objects acted on levels that are simultaneously physical, symbolic and referring to memory and cultures."* (Iaconesi & Persico, 2010)

Influenced by this association, we conceived each artist's page as a unique Online Fluxus Box. The materials of different nature are placed randomly on these sites as if stacked in a box, and each time the page is loaded, they are spread out in a different constellation. A common element has been labelling the items on the pages with numbers; their descriptions can be traced to the List of Images page (see Figure 6). This section also includes a short, loosely conceived text in which each of the artists described their personal experiences during the pandemic period and provided brief biographical details. The user can, therefore, freely manipulate the materials stored in the digital box, rearrange them, scroll through them to put them in a new context, or simply search the alphabetical List of Images, but also enlarge and reduce individual images as needed. (see Figure 5) This way, it was possible to simulate the web user's interaction with a box full of images in which users can rummage and find their paths and meaning associations.

Figure 4: Maciunas, G. (1967). Flux kit. Retrieved from https://en.wikipedia.org/wiki/Fluxus#/media/File:FluxYearBox2.jpg

The design of the site interprets the name Černá skříňka / Black Box in both graphic and technical terms: its functional features fulfil the purpose of being a box for preserving records of artistic creation and artists' lives during the pandemic. However, in its formal characteristics, it also fulfils the concept of the black box as we know it from the field of computing. For it offers an imaginary journey inside technology, a glimpse into the black box of the internal processes and workings of computing. These processes are usually hidden in the background of the graphical interface, but in the case of the Black Box website, they are brought to the surface. In this way, the Black Box claims its essence as a programmed medium (Figure 7).
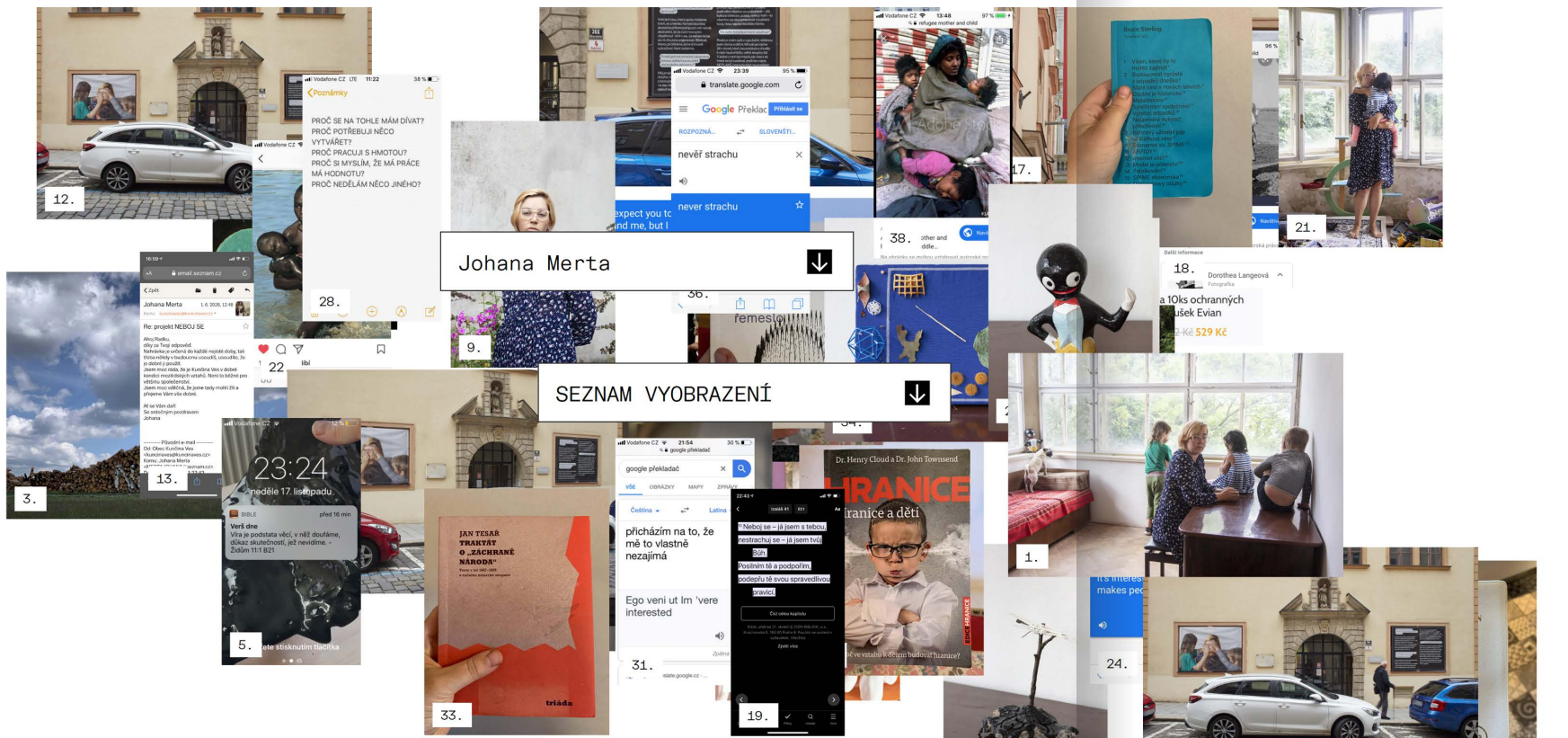
SKUPINA #2

SKUPINA #4
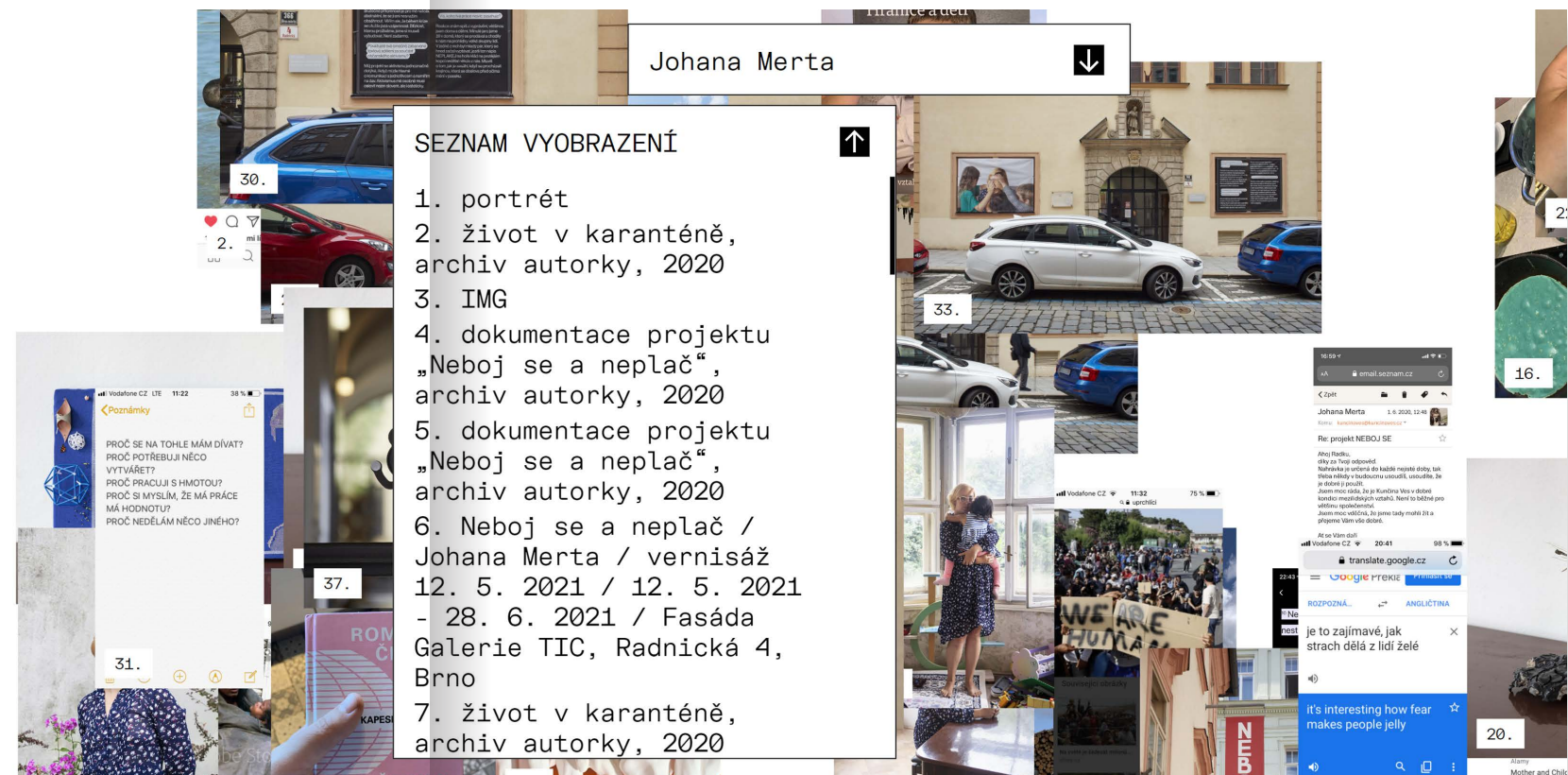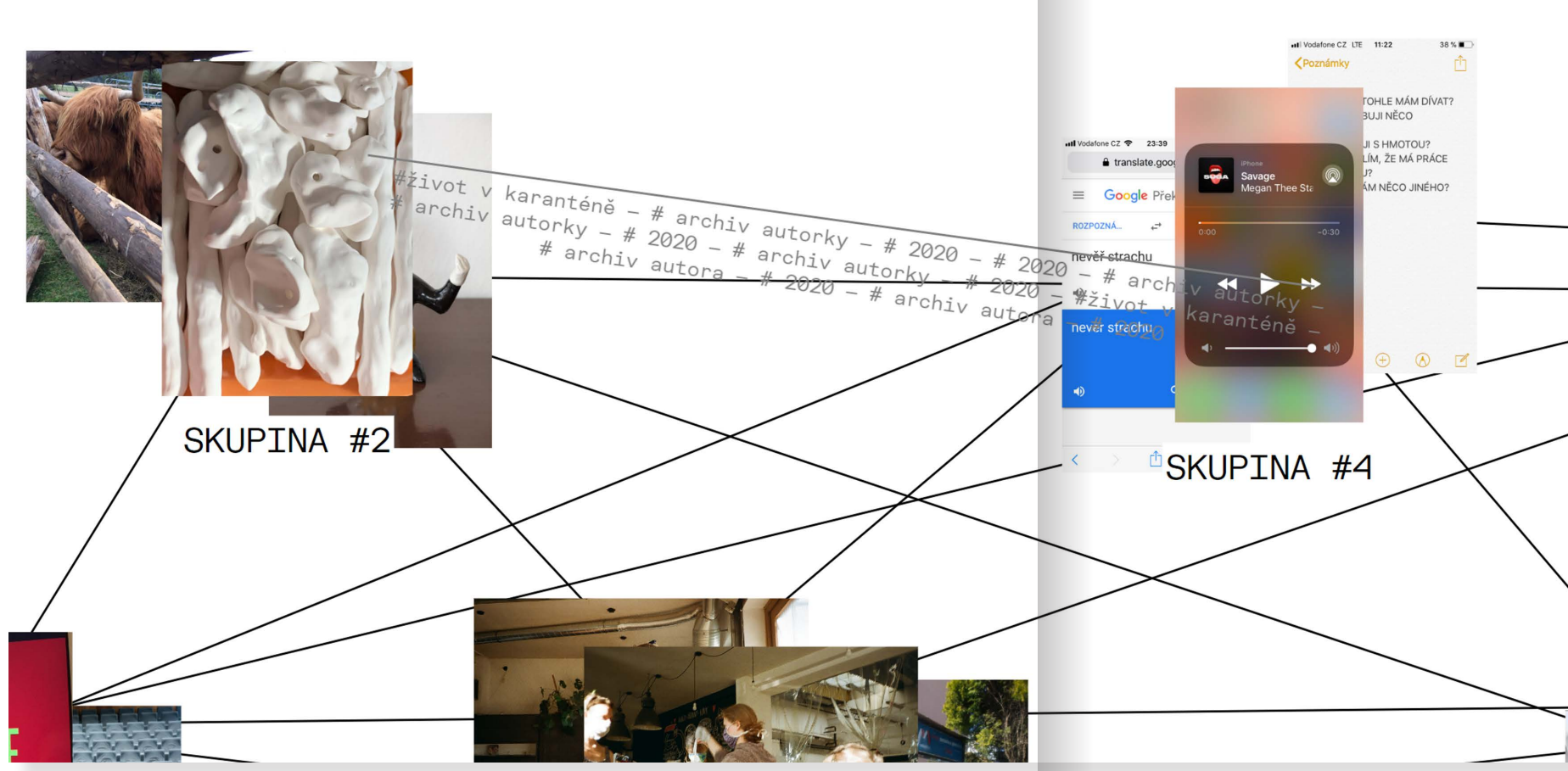
CODING BLACK-BOX WEB IN DAWN OF MACHINE LEARNING AKA WE USE CODE TO COMPILE CODE

As a little joke, the programmer Oliver Staša set up the loading console on the website to dump *JSON*-like content. Entering the page, the user can see a black box filled with passing text on the top before the content is loaded. This console showdown was done to allow visitors to see a part of what is happening when the website is being loaded and constructed. Code-like, this is how data gets transcribed from a database of strings[1] to formattable content (e.g. *HTML DOM*[2]) every time we visit a modern website. This is currently the most common way of exchanging data between the back-end (server) and front-end (user) app layers. It is also easily set up, maintained and supported by a wide variety of programming languages, although other methods like *GraphQL* or even better

1   String is data type described as text (non-numerical type to be transcoded according to character table like ASCII or UTF-8).

2   HTML DOM is a set of elements making up the page the user sees rendered in the browser.

gRPC (*Protobufs*) are faster, cleaner and less energy-consuming[3]. *JSON* is part of a data transfer API family *REST*. It is a kind of human-readable data format that states the key name and its allocated value in a strictly formatted string: *{"key": "allocated value"}*, which decoding is widely supported and also makes common sense. In terms of big-data, *REST* is the least effective way to go, but since websites are primarily about simple text content, this is the most widely used method across small string-type data passing. When the app gets bigger, energy consumption to pass the data becomes larger roughly by linear O(5n) and slower by O(10n) compared to *gRPC*, which is one of the reasons why big-data companies do not use *REST APIs* and save computing time and energy on a large scale, abandoning the human readability attribute of *JSON*.

3   With gRPC, less bytes are required to transfer the same data for the price of not being readable by a human.

```
›  { ”url”: ”/data/projects/T1ih7nvy.jpg”, ”msg”: ”loaded”, ”status”: ”91%” }
›  { ”url”: ”/data/projects/XXcfg2LR.jpg”, ”msg”: ”loaded”, ”status”: ”95%” }
›  { ”url”: ”/data/projects/OKXGKAJW.jpg”, ”msg”: ”loaded”, ”status”: ”100%” }
›  { ”images”: ”loaded” }
›  { ”memex”: ”loading started” }
›  { ”projects”: ”loading started” }
›  { ”fce”: ”chord_tester”, ”chords”: { ”x”: 22, ”y”: 70.75 }, ”passed”: true, ”msg”: ”passed at [2] try” }
›  { ”fce”: ”sidekick_img”, ”chords”: { ”x”: -8.9575, ”y”: -3.6531 } }
›  { ”fce”: ”chord_tester”, ”chords”: { ”x”: 123, ”y”: 69.75 }, ”passed”: true, ”msg”: ”passed at [7] try” }
›  { ”fce”: ”sidekick_img”, ”chords”: { ”x”: 8.745, ”y”: 3.4736 } }
›  { ”fce”: ”sidekick_img”, ”chords”: { ”x”: -6.6242, ”y”: 3.2359 } }
›  { ”fce”: ”chord_tester”, ”chords”: { ”x”: 131, ”y”: 31.25 }, ”passed”: true, ”msg”: ”passed at [5] try” }
›  { ”fce”: ”sidekick_img”, ”chords”: { ”x”: 7.6004, ”y”: -4.229 } }
›  { ”projects”: ”loaded” }
›  { ”connections”: ”loading started” }
›  { ”id”: ”prjjohana-merta-2020”, ”obj”: { ”h”: 468.641, ”w”: 512, ”x”: 563, ”y”: 947 }, ”tag”: [ ”aktivismus”,
   ”víra”, ”hudba”, ”rodina”, ”kurátorství”, ”venkov”, ”příroda” ] }
›  { ”id”: ”prjjuliana-hschlova-2020”, ”obj”: { ”h”: 468.641, ”w”: 512, ”x”: 3148, ”y”: 933 }, ”tag”: [
   ”environment”, ”kresba”, ”malba”, ”koláž”, ”karaoke”, ”aktivismus”, ”biomalba” ] }
```

The current way of developing programming tools[4] tends to prioritize the developer's time by means of making it as easy as possible to use. The demand for a fast development process leads towards detaching the praxes of programming from its core (hardware) functionality. One thing is trans-compiled to another several times, layer after layer before the final transcription gets compiled and the final production code is built. This is due to the tendency to make programming faster, universally optimized, secure and maintained by approaching natural language syntax – bringing the first layer of some programming tools almost to the realm of written speech. This method may result in lengthier computation times, but more crucially, it places modern programming tools within the black boxes of superior compilers, even for developers. This is inevitable as technology becomes increasingly complex and layered; specialization is normal as programming becomes more widespread. In addition, this does not imply that the final code is ineffective; on the contrary, it is standardized and efficient. It is just a process that is indirect and straightforward. In the end, there is a machine-level effective code.

Using the *Tensorflow*[5] code library to compute the ML results in this project can serve as an example. To use it, a developer writes a couple of dozens of lines of code where the content is selected and prepared to be processed and where the core library is set up and called to action. While the real code computing the result is millions of lines long, written and maintained by thousands of contributors, the programmer just uses it. In the end, there could be a *GUI* (Graphic User Interface, the common way users interact with applications – buttons, images, textareas, etc.) to set up *TensorFlow*, so that we would not need Python[6] code to run it. The programmer would select the images, tweak a few sliders, and wait for a result. It is also possible to set it up using voice commands, contributing to about a quarter of queries in HCI[7]. With *OpenAI's DALL-E2* or *ChatGPT* it becomes apparent that the process of creation in terms of HCI is strictly dependent on the ability of the user to describe their thoughts with words or sentences, as that is their fundamental method – using key*words*. Following the same trend – to quantify the means of creation that mirror the user's native language.

4   Programming tools could be, for example, APIs, frameworks or programming languages.

5   Tensorflow is a framework that allows developers to build and deploy ML models.

6   Python – programming language

7   HCI – Human-Computer Interaction, could be writing text using a keyboard, clicking on a button, or speaking to a microphone (e.g. "Hey Siri" commands).

Final thoughts about the AI curator: In this project, Machine Learning (ML)[8] was used to sort visual content based on its similarities. From my point of view – like any type of ML of this kind, including current popstars like *DALL-E / Imagen* or *GPT*, this process was developed, handpicked, adjusted, and supervised by a person and is, therefore, deterministic and traceable to the last byte. I think we should approach it as such. I often encounter starry-eyed approaches to ML results. Treating the process itself as a "black box" where we cannot actually see what is happening should not make it more divine than pressing the enter key on a keyboard, being oblivious to the process behind the wonders it just set in motion. Thus, getting used to the enter button performing so many things seemed amazing back in the 90s; this is also bound to be the case concerning ML generating new sets of novel or creative combinations in the 2020s.

8   I prefer to refer to current AI models as Machine Learning because, in my experience, AI does not exist yet, and it is more of a sci-fi concept, a catchphrase if you will; current mechanisms are better described as ML. I believe this saves some thought because it does not sound so out of hand, as we are talking about node-pulling vectors.

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Nelson, H. T. *Xanadu*. Retrieved from https://www.xanadu.net/
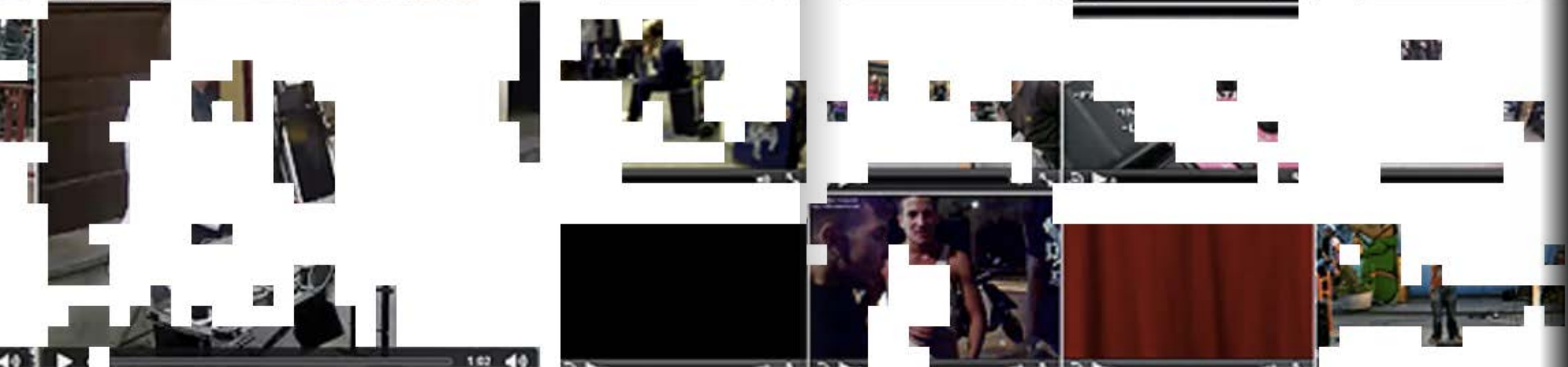
LIST OF QUOTED ARTWORKS

Maciunas, G. (1967). Flux kit. Retrieved from https://en.wikipedia.org/wiki/Fluxus#/media/File:FluxYearBox2.jpg

CURATING ONLINE 2020

2020: WAS IT THE END OF CURATING ON THE WEB?

MARIALAURA GHIDINI

THE YEAR 2020

The act of curating exhibitions online was unfamiliar to the most until mid-2020, when the world was in the midst of the first wave of lockdowns in response to the Covid-19 pandemic. Till then, there were a handful of people discussing it — though many were the curators that had operated on the web since the 1990s. And till then, the web was often considered an unusual site for curatorial practice, and web exhibitions a corollary to curatorial work. But after March 2020 this scenario seemed to have undergone a change.

I began my research into curatorial work on the web when I founded the curatorial platform **or-bits.com** in 2009. Since then, I had been exploring it as a field of practice that, for its site-specificity, moves away from the 'common protocols' of exhibition-making in the gallery space, demandinga revision of the concepts of authorship, selection & display, collection & archive, as well as audience participation in artistic and curatorial processes. In 2011, I started to systematically collect information about web-based exhibitions that recently culminated in a collaborative effort with researchers and curators Annet Dekker and Gaia Tedone: **The Broken Timeline** (Dekker, Ghidini, Tedone, 2021), which presents a lineage of web-based curatorial projects from the 1990s till now. Gradually my interest turned to the ways curatorial work interferes with the workings and assumptions of networked platforms and interfaces — a research I am carrying out with the project **curating.online** (Ghidini, 2020). However, the curatorial responses to the pandemic in 2020 made me ponder about the significance of curating in the online environment at large. It was a time in which the relationship between being online and offline was completely overturned, to the point that one of the questions I recently started to pose to several curators pointed at the end of curatorial work on the web. I asked them:

"I think the pandemic marked the death of curating on the web as I understood it, or at least it marked the end of its role as a space for exploring the production, display and distribution of art on the web. What's today's web?" (Ghidini, 2020)

To my surprise, the responses I have received are more hopeful than the question I asked. But before discussing this, I will take a step back.

WHAT HAPPENED, ROUGHLY

Writing this chapter in 2021, soon after the invitation to take part to the symposium **Curating Online**, which came in the midst of my third lockdown during the second wave of the pandemic in Bangalore (India), I was forced to think about the transformations of curatorial work as a consequence of the physical, social and economic restrictions of the Covid-19 pandemic, especially in connection to the spaces we inhabit,

TITLE
Reclaiming the platform space as an art form with Cosmos Carl

AUTHOR
Frederique Pisuisse   Marialaura Ghidini

DATE
08/10/2021

DESCRIPTION
Frederique Pisuisse talks about the work of Cosmos Carl. Pisuisse discusses their interest in sustaining the work of artists who create art through platforms, while giving life to a space that is parasitical and goes with the flow of the natural habitat of the online environment.

TITLE
The analogical-digital subject: ubiquitous identity in transit within and against techno-communication

AUTHOR
Marialaura Ghidini   Massimo Canevacci

DATE
07/10/2021

DESCRIPTION
Massimo Canevacci talks about the role that digital technology and its dimensions have had on his work as an anthropologist and ethnographic research. He talks about the analogical-digital subject and the ubiquitous identities that cross the contemporary subject, telling us about their potentialities in facing our relationship with technology and especially processes of transformation. And it does so by introducing us to the idea of a non-anthropocentric and mutant anthropology.

Figure 1: Ghidini, M. (2020–). curating.online — Interviews section (2021). Screenshot of web page from 2022. Retrieved from https://www.curating.online/

we cannot inhabit, or we are forced to inhabit, physically and virtually. Over the span of a year, I witnessed a mass migration of the artistic programmes of art institutions and galleries online, whether on existing platforms and social media channels (mostly), or on custom-made websites (infrequently). This was a movement, I thought, that asked for further questions about curatorial approaches to exhibiting art online.

For the symposium's talk, I therefore decided to start to observe the present in relation to its past — although at the time I was struggling to grapple with a present that was overcrowded with online social, cultural and work-related activities. I dived back and re-read an essay by curator Christiane Paul, in which she states:

"The changes in the curatorial role tend to become most obvious in online curation, which by nature unfolds in a hyperlinked contextual network. While some aspects of the curatorial role — such as selection of works, organization of exhibits and their art-historical framing — still apply to the process of online curating, transformations occur in the process of filtering, "describing" and classifying within the online environment. The Internet is a contextual network where a different context is always only one click away, and everyone is engaged in a continuous process of creating context and re-contextualizing." (Paul, 2009)

I consider Paul's analysis one of the first that brings a shift in the discourse about curatorial work on the web: from the idea of working with immaterial objects to an analysis of the characteristics of the technological context in which curating takes place — a shift that had already occurred in the context of net.art but was rather new in the context of curatorial studies, especially 15 years ago. Although the technological context described by Paul has become more layered since it is now entangled with more rigid, yet almost invisible, economic and power structures, her essay brings forth a critical element for discussing curating on the web: the nature of such work is affected by working of the networked environment, and it requires new forms of negotiation and renegotiations, as well as viewing and engaging with art.

Figure 2: Curating Online symposium (2021). Screenshot of presentation from 2021. Author: Marialaura Ghidini

THE LINEAGE, OR ONE OF THE POSSIBLE INTERPRETATIONS, OF CURATING ON THE WEB

Since the introduction of the first web browser, Mosaic, in 1993 to the present multitude of downloadable apps that are interoperable across multiple devices where user's content is stored in various privately owned clouds and servers, the way the tech industry has developed its services, and users experience them, have shaped (and have been shaped by) the modes in which curators and artists adopted the web for the production, display and circulation of art. However, there are just a few discursive spaces and archives dedicated to the observation and mapping of curatorial projects on the web. Amongst them there is: the **NEW-MEDIA-CURATING List** (2000–) by CRUMB at the University of Sunderland; the portal **netartnet.net** (2010–) by artist Anthony Antonellis; the artwork **An Incomplete Timeline of Online Exhibitions and Biennials** (2013) by Oliver Laric ; the **Bay Area Online Exhibition Archive** (2016) by curator Enar de Dios Rodríguez; the recent research work of **Off Site Project** (2017-) by Elliott Burns and Pita Arreola-Burns; and the already mentioned **The Broken Timeline** (2020) and **curating.online** (2020–).

I put a stress on this because during the boom of curated exhibitions online in the year 2020, audiences were often confronted with announcements claiming that the shows they were viewing were the 'first' to present artworks from across the globe, or by new emerging artists, or developed through collaborative efforts — claims that seemed to disregard the long history and richness of the field of curating in the networked environment. Because of this, tracing a brief lineage of curatorial strategies on the web might be useful to understand the inaccuracy of many claims that were made over the course of that year.

In the early 1990s, the web browser (with its visualisation of computational processes) meant that the web became a new medium for making and displaying art. At that time, the web was not yet a slick, user-friendly and visually dominated environment like the one of the following decade. Yet, it started to move away from command lines and text-based content,

The Broken Timeline

Marialaura Ghidini, Gaia Tedone, Annet Dekker
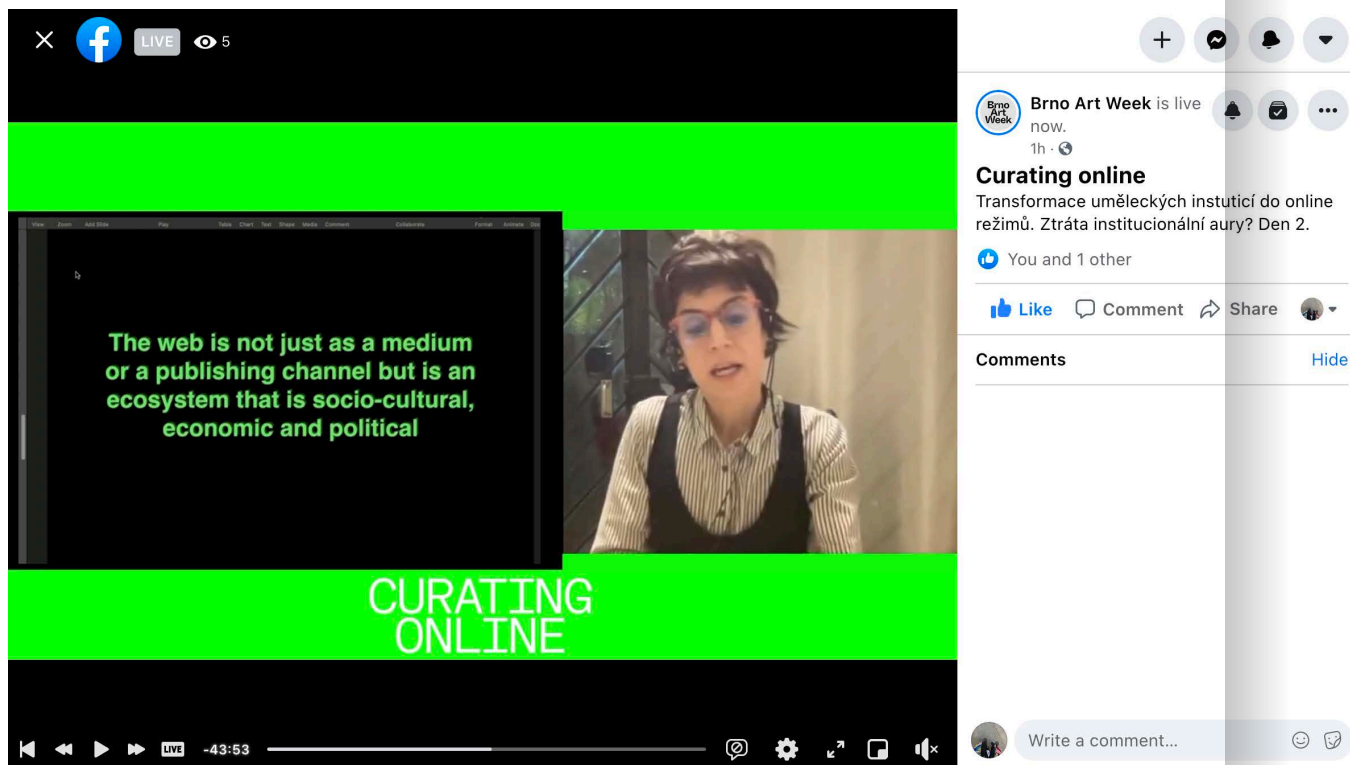
The Broken Timeline (TBT) presents historical exhibition projects that were curated online. Inevitably partial and subjective, TBT burrows back in time to present a lineage of web-based curatorial projects that are too often unseen, neglected or ignored by the mainstream artworlds and their discourses.

Read more

TYPOLOGY:

ORGANISATIONS
- **ac** Art Centre
- **a** Artist
- **b** Biennale
- **c** Commission
- **i** Institutional
- **m** Museum

SOCIALS
- **Ig** Instagram
- **p** Platform
- **sm** Social Media
- **t** Tumblr

SPACE
- **cr** Chat Room
- **c** Commerce
- **e** Exhibition
- **f** Festival
- **o** Offline
- **p** Publishing
- **vr** Virtual Reality

TOOLS
- **3D** 3D
- **app** App
- **db** Database
- **dt** Desktop Tour
- **d** Download
- **ml** Mailing List

INITIATED BY
- **a** Artist(s)
- **c** Curator(s)
- **d** Designer(s)
- **i** Institutional
- **r** Researcher(s)

1982

- Minitel launches
- Smiley emoticon first used online

1983

- ARPANET (TPC/IP)

Figure 3: Dekker, A. & Ghidini, M. & Tedone, G. (2021, May 4). The Broken Timeline. In Curating Digital Art: From Presenting and Collecting Digital Art to Networked Co-Curation. Valiz and online. Retrieved from https://thebrokentimeline.valiz-makingpublic.net/ Screenshot of web page from 2022.

and the need to be a computer-savvy user. New services like GeoCities (1995) allowed a wider spectrum of people to use the web as a new site to share their personal ideas and creativity; marking a new era for communicating and publishing. Despite this, the institutional art world still understood the web hierarchically, and only rarely saw it as a space for displaying art in its own right. Few were the institutional initiatives, which were mostly located in the USA, such as: the Dia Art Foundation's **Artists Web Projects** (1995); the digital foundry **äda'web** (1995-1998) initiated by Benjamin Weil and John Borthwick, which also included curatorial projects like **STIR-FRY** (1996) by Barbara London; and **Gallery 9** (1997–2003) at the Walker Art Centre.

Although these projects were pioneering in their approach to commissioning web-based art and also displaying it on bespoke websites (as in the instance of **äda'web**), it was mostly artists — especially net.art artists — who generated awareness of their web-based projects, and created spaces for showcasing and archiving their art. A well-known instance is that of **Art.Teleportacia** (1998–) by Olia Lialina, which presented exhibitions of peer artists while also proposing a critique of the institutional art world by offering on-demand net.art works over the internet accompanied by critical texts and certificates of authenticity. In this scenario, there were also projects that proposed an exploration of spaces connected to 'being online', like the desktop, as in the instance of **Desktop Is** (1997) by artist Alexei Shulgin. With this project, the computer desktop became a place to explore the relationship between the *"man and machine"*, as well as *"a window into the digital world"* (Desktop Is, 1997). Through posting on a series of internet mailing lists dedicated to art, Shulgin invited artists to submit images of their desktops over the course of several months, giving life to a new way of exploring the emerging relationship between people and digital technology, as well as producing art.

With the increasing platformisation of the web in the first decade of the 2000s, the gap between the technology and its users diminished even more, also because of ready-to-use interfaces and services. This generated a major shift in the production, display and engagement with art online — an environment increasingly characterised by an entanglement between consumption and production, as well as culture and entertainment. The new modes of communication and publishing enabled by services like Wordpress, YouTube, Myspace and Facebook gave life to new exhibition strategies that were often based on responding to the logic of platforms. For example, the possibility to freely access vast databases of cultural content produced directly by users triggered projects like **CuratingYouTube** (2007–). Its curator, Robert Sakrowski, set out to explore the role YouTube played in the context of contemporary art production by co-creating with artist Jonas Lund a piece of software, the Gridr, which allowed for the creation of thematic assemblages of video material from YouTube. The project played with the way user interaction is orchestrated by algorithmic and design choices, raising questions about the role of the curator and the artist in the age of algorithmic suggestions.
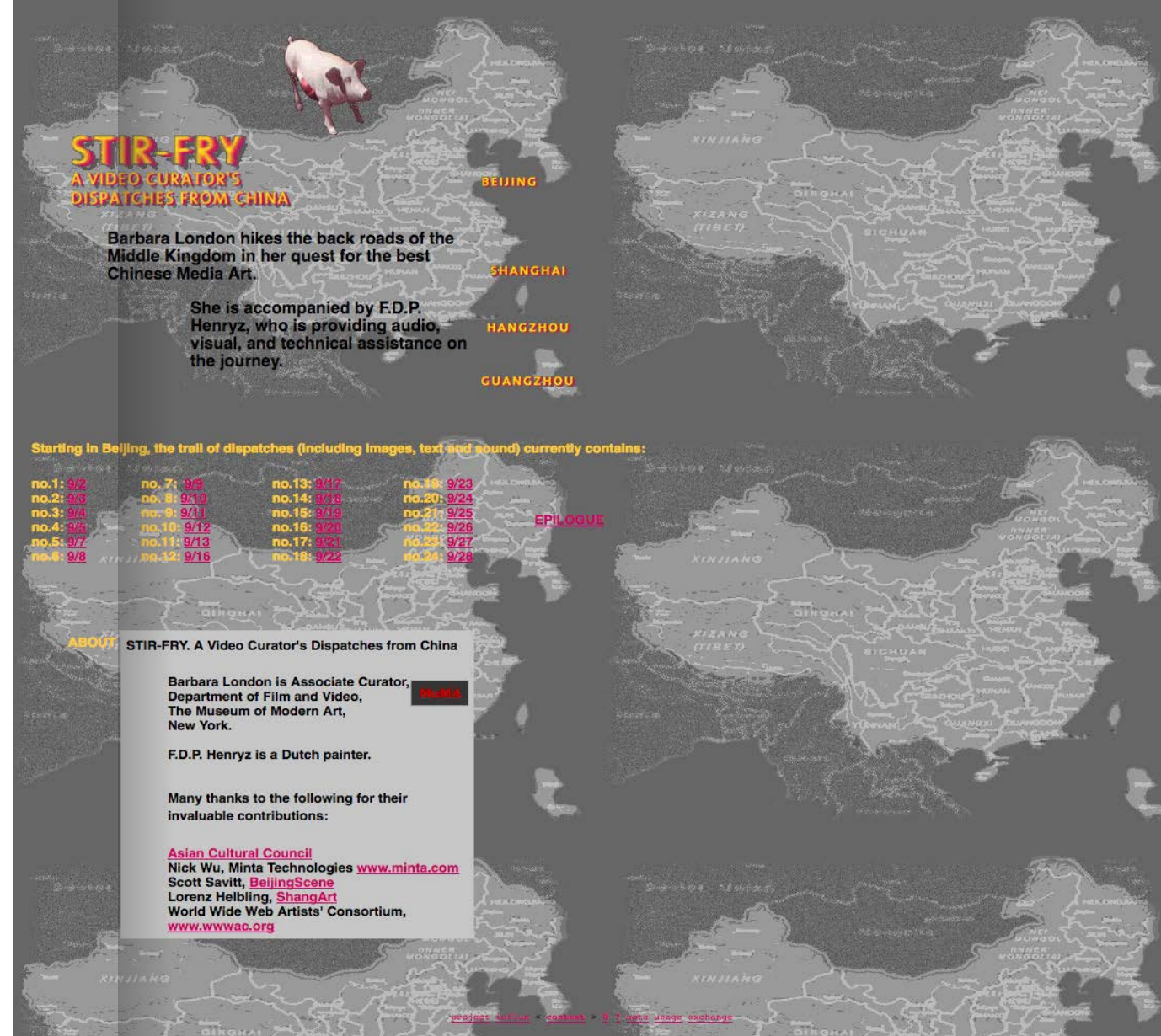
Figure 4: London, B. & äda'web. (1996). STIR-FRY — Index page. Retrieved from http://adaweb.walkerart.org/context/stir-fry/. Screenshot of web page from 2010.
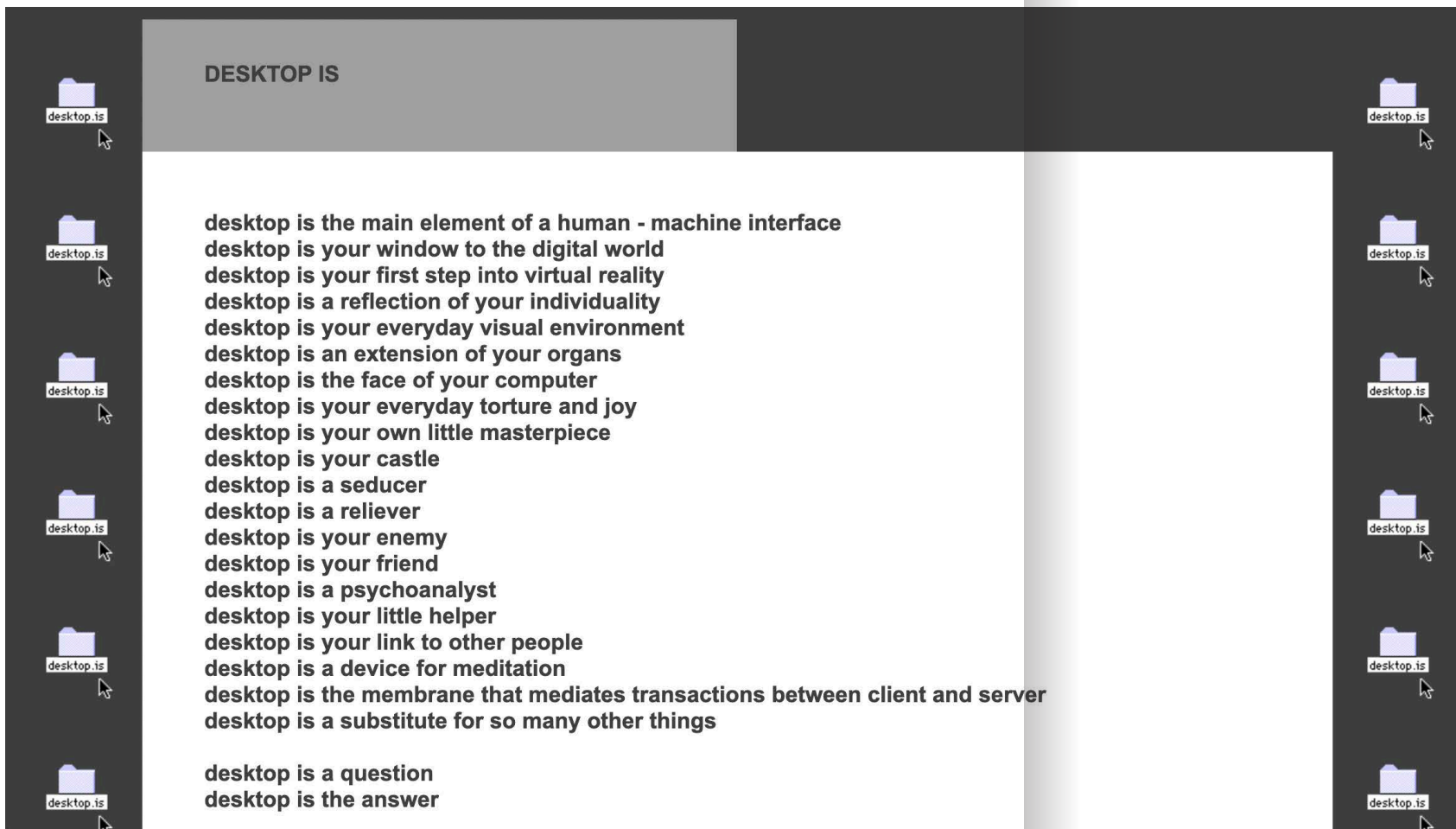
Figure 5: Shulgin, A. (1997). Desktop Is — Index. Screenshot of index page from 2010.

Other projects directly responded to platforms for social interactions and used them as exhibition sites. On Facebook, there are projects like **Gallery Online** (2012–2018) whose curators, Ronen Shai and Thomas Cheneseau, presented exhibitions as live performances, and **#0000FF** by Georges Jacotey, where artworks were conceived to disrupt viewers' browsing routines and the relationship between public and private, and work and leisure while scrolling feeds.

Other projects, instead, appropriated tagging systems such as that of Delicious. For example, **Tagallery** (2007) by cont3xt.net (Sabine Hochrieser, Michael Kargl and Franz Thalmair) questioned the significance of an exhibition context created through associations, and that of an artwork when represented by a link. While many exhibitions of that period often appropriated existing web-tools and platforms, others were curated on purposely built websites that offered the audience different forms of navigation and interaction with artworks. Some of them are: **Temporary Stedelijk** (2010–2012), curated by Kalle Mattsson and Amber van den Eeden, which experimented with navigation patterns that were created using iFrames on the project's page; **or-bits.com** (2008–2025) curated

by myself, which experimented with transitioning exhibitions to different display formats — online and off; **Bubblebyte** (2011–13), curated by Attilia Fattori Franchini, Rhys Coren and Paul Flannery, whose exhibition strategy developed into the act of taking over institutional websites with artists; or **Link Cabinet** (2014–2019), curated by Matteo Cremonesi, which hosted site-specific artworks on a single web page that were archived after a certain period of public viewing.

There were also projects that furthered the exploration of the desktop environment to create ad-hoc downloadable displays, as the case of **Idle Screenings** (2012–) by Mitch Trale and **ScreenSaverGallery** (2012–) by Barbora Trnková, Marie Meixnerová and Tomáš Javůrek. Moreover, an exploration in creating unexpected connections between the computer window and a real field location to present artist's performances, is exemplified by **Field Broadcast** (2010–2013) by Rebecca Birch and Rob Smith. These experimentations furthered the growth of the art platforms and its potential for multiple functionalities, where curators set up spaces not only for the display of web-specific art but for devising new modes of producing and engaging with it.

Figure 6: Sakrowski, R. (2007-). CuratingYouTube: An Acoustic Journey through YouTube (2011). Retrieved from http://www.curatingyoutube.net/about.html. Screenshot of HTML soundbank from 2021.

This was also a time during which the platform economy, with its services and apps, began to replace the web browser with mobile interfaces; generating a web that was developing into a more compartmentalised environment that was (and still is) centralised and made of interconnected services. Increasingly, the distinction between online and offline sites of display started to disappear. Although such fading distinction started to be explored in earlier projects, such as the **Widget Art Gallery** (2008–) by artist Chiara Passa, which functions as a 3-dimensional "single art-gallery room that fits into people's pockets" (Widget Art Gallery, 2008), other artists started to explore it in connection to the commercialisation of the web and its corporate rhetoric, which was progressively sipping into the day-to-day life of its users. An example is **Projected.Capital** (2018), curated by Silvio Lorusso and Sebastian Schmieg, which, via a Paypal button (and a fee), allowed artists to buy a piece of a website that would display their art online while beaming it on the walls of Roehrs & Boetsch gallery in Zurich (Switzerland) — a commentary on the workings of the art system and the role of the artist in it. Another example is **#exstrange** (2017), curated by artist Rebekah Modrak and myself, which used eBay and its auction system as a site for artistic production and cultural exchange across geographical locations — an exploration on the role of marketplaces and their algorithmic classification when browsing for items to purchase.

The pandemic broke at the point in time in which this type of curatorial exploration was taking off, and with it it halted the experimental activities of platforms like **Greencube.gallery** (2017–), which was founded by Guido Segni and Matìas Ezequiel Reyes with the aim to *"to flow in and out of the digital screen in order to stress the limits and the relationship between virtual and real."* (Greencube.gallery, 2017). From this point onwards, the trajectory that curating exhibition on the Web was taking started to take a different turn.

THE CURATING TRENDS THAT HAVE AROSE

Until 2020, the lineage I sketched above indicated how the curation of web-based exhibitions acted as a context-sensitive practice proposing manifold approaches to operating in the online environment. The trajectory of its development goes from working with websites site-specifically to highlight the qualities of the web medium, to reflecting upon viewing habits in the context of contemporary art, as well as creating curatorial strategies based on communal efforts. Further, it includes exploring alternative archival structures and audience-based categorisation, and critically confronting the role of mediation that interfaces have in the day-to-day lives of users.

In the year 2020, however, the general focus of contemporary art institutions and galleries shifted away from critically observing the characteristics of the technological context in which curating takes place — as highlighted in the above-mentioned essay by Paul. While many

Figure 7: Birch, R. & Smith, R. (2010-2013). Field Broadcast. Retrieved from http://fieldbroadcast.org/index.html Screenshot of computer desktop from 2010.

artists and curators operating online took a pause for a reflection, and other researchers pondered about the state of being online while locked up inside their homes, the art world often responded uncritically to the limitations resulting from the pandemic by hurrying to be online, as if the online sphere was the only way to confront a present devoid of inter-actions in physical spaces, both public and private ones.

The words of ethnographer Massimo Canevacci in his book **Minima Viralia** (2020) are a reminder of the complexities inherent to a day-to-day life mediated by online channels of communication, as well as a testimony of the difficulty in dealing with them:

> *"The dramatic experience that we are living because of the virus is favouring even more the penetration of the ubiquitous identity into everyday life. Paradoxically, staying at home, everything that hap-pens outside involves me and overwhelms me."* (Canevacci, 2020)

The hurry of the institutional art world to be online often fuelled a sense of bewilderment during that period, both for the sheer number of different initiatives and for the choices about how to relate to an audience. While live talks, conferences and seminars fulfilled some of the educa-tional needs of professionals, researchers as well as artists and students, a prevailing tendency in exhibition formats was that of replacing what was

Figure 8: Greencube.gallery — Index page (2017-). Founded by Guido Segni and Matìas Ezequiel Reyes. Retrieved from https://greencube.gallery/. Screenshot of index page from 2021.

unreacheable — the gallery — so that the white cube experience made its appearance on people's screen in numerous variations. The temptation of replicating the experience of viewing art in isolation, instilling a sense of contemplation without interference from the outside world, gave form to viewing rooms, 3D rooms and sound-filled navigable spaces. An example amongst many others is **AORA** (2020), which, tellingly, was presented as *"a virtual platform that instills a sense of calm and wellbeing through the curated meeting of art, architecture and music."* (AORA, 2020); or **In Touch** (2020–), a collaboration between 13 galleries in India, that was promoted as *"a unique platform […] that enables the art community to con-nect with each other through organized and synergistic exhibition-making that challenges traditional formats of engaging with art"* (In Touch, 2020) — during my presentation for the **Curating Online** symposium I showed a screenshot of myself sat in a row of white seats in a cinema-like setting; a feature offered to the audience when browsing the exhibition.

Another trend that came forward quite visibly was live broadcasting, and not only for educational programmes. Earlier experimentations with live streams, and the concept of disrupting people's behaviours and routines while on their computers, returned in manifold ways. But this time it was mostly artist's commissions on platforms like Instagram or artist's per-formances streamed on proprietary video platforms, which added little to the day-to-day lives of audiences whose routines had already been greatly disrupted by something that was beyond their understanding, and outside their computers. Following this thread, there was the new exhibi-tion trend of offering virtual 'experiences'. This was usually presented in the form of 3-D worlds for audiences to wonder about while searching for artworks. Only rarely such projects presented renewed experiences, as in the instance of the project **Screen Walks** (2020–), whose curators, Jon Uriarte and Marco De Mutiis (in a collaboration between the Fotomuseum Winterthur and The Photographers' Gallery) presented a programme of thematic live web journeys by artists and curators.

Although the resilience showed by such initiatives is laudable, the year 2020 felt more like the end of curatorial experimentation on the web because the values and ideas that first accompanied operating in the online environment were rarely taken into consideration — shock and need most likely played a substantial role in it.

WHAT REALLY HAS HAPPENED AND WHAT TO DO NOW?

At the time of writing this text, I kept going back to the questions: What do we mean when we talk about public space today? And how can connectivity and sustainability play a role in a world that has drastically, although temporarily, shifted online?

I then started to look at the approaches of several independent curators that had already been operating online and came across strategies that helped me to think through these questions, and the feeling of doom I felt towards the future of the field of curatorial work on the web. Beside **Greencube.gallery**, whose stance I found refreshing, in that they suspended their activities online under the banner *"URL is not enough"* during the lockdown, I looked at the work of **Emotional Interfaces** (2019–). Curated by Virginie Tan and Astrid Lours-Riou, the platform was born from the following question: How do digital interfaces shape emotional behaviours? If pre-pandemic, their focus was on creating web-based exhibitions that could act as a *"world where one can get lost"* (Lours-Riou & Tan, 2021) and moved away from the seamlessness and user-friendliness of the ubiquitous digital services, during the pandemic Tan and Lours-Riou's approach changed. They decided to address their audience directly on the walls of an exhibition venue in Paris (France) with the exhibition **UNCERTAINTY-19 x EP7** (2020). Being confronted with the steep increase of online activities, they decided to explore the idea of the interface by giving life to a sort of a physical *"Twitter mural"* (Lours-Riou & Tan, 2021) to be experienced by passers-by in the period between the two lockdowns in Paris. As a complement to the exhibition that would not be accessible to everyone in real life, the curators documented it online by mimicking mainstream communication channels, whereby the documentation of the artworks was accompanied by interviews with artists, which used intimate language to discuss their works and feelings, such as *"How do you feel?"* and *"How was the year for you?"*.

While there are many more examples, one that I would like to mention is the service platform **common.garden** (2020–) conceived by artist Constant Dullaart that was used for a series of online exhibitions curated by institutions such as Upstream Gallery (USA) and HMKV Hartware MedienKunstVerein (Germany). The platform allowed audiences to encounter other people while navigating an exhibition space in which they could literally bump into each other while viewing artworks and have conversations. This setting provided an intimate yet cheerful and meaningful way of nurturing connections and exchanges in an online space beyond chats and messages.

These few projects which do not do justice to other valuable independent endeavours, are to me an example of context-specific curating. They are examples of exhibitions that moves beyond the technological, that is the way a medium works and the possibilities inherent to its use, to embrace the social context in which such medium evolves — in this case,
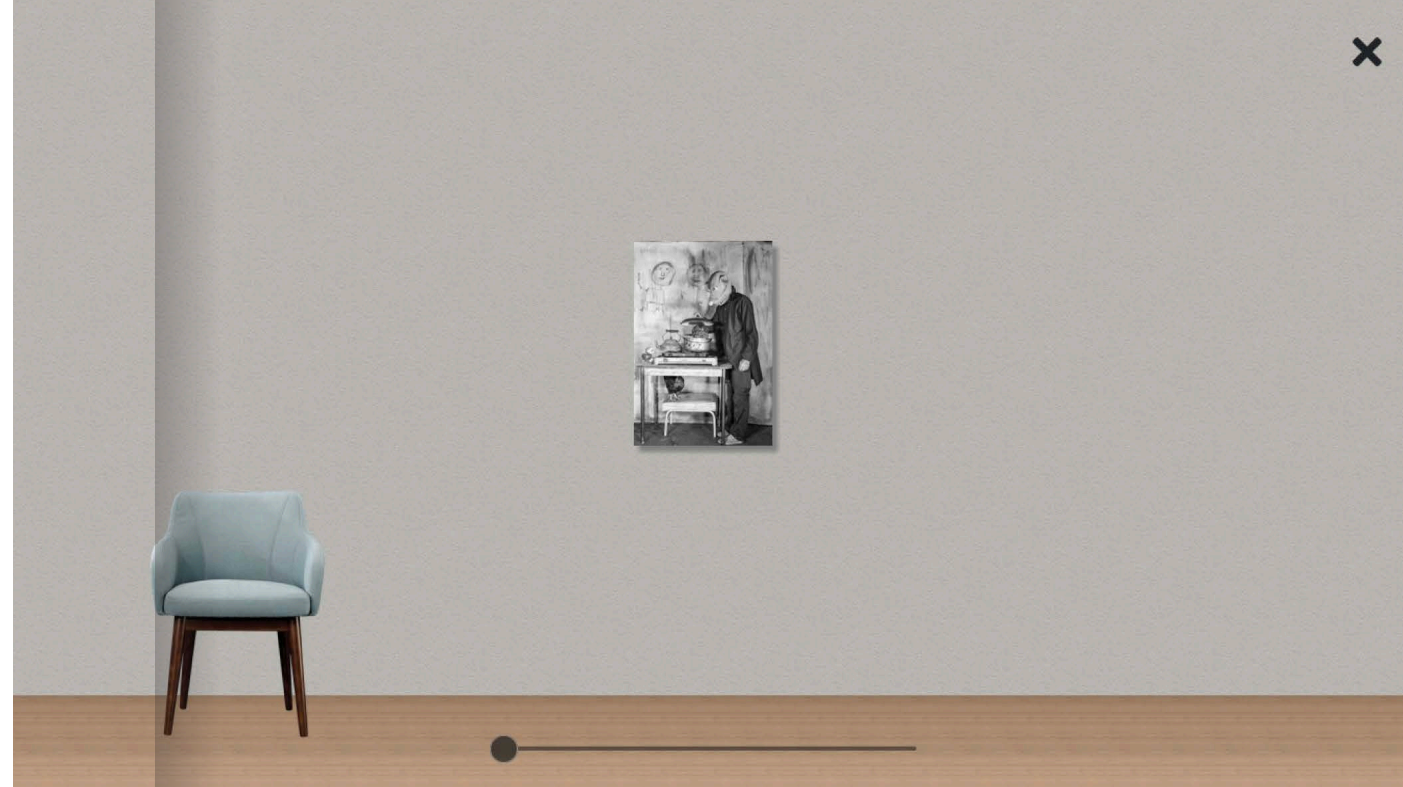

Figure 9, 10: IN TOUCH — Exhibition Viewing mode (2020). Retrieved from https://www.artintouch.in/about/. Screenshot of web page from 2020.

curating on the web at a time in which the online sphere is overcrowded and the offline sphere is devoid of interaction.

I started this text by raising the question whether the year 2020 reflected the end of curating on the web. Probably not, because while I was digging on the internet I came across many examples (often hidden from the mainstream) of what I described as the effects of a necessity to develop new forms of negotiation and renegotiations to view and engage with contemporary art, and art produced to exist online. These are projects where the curator does not act as a content distributor complying with the rules of existing interaction network platforms, while depending on likes and shares to understand their audience but creates new spaces for the production and distribution of contemporary art, whereby each new and evolving presentation format has politics inscribed within it.

According to the voices of the artists and curators I interviewed in 2021, there is more to explore; as artist Sebastian Smeigh said:

"The web is always under pressure from apps, platforms, etc., but at the end of the day it is still an incredibly lively medium, with the browser probably being the most important piece of software we have. So working with the web is crucial to securing and developing our future, not just as artists and curators." (Smeigh, 2021)

Figure 11: Emotional Interfaces — Index Page (2019). Curated by Virginie Tan and Astrid Lours-Riou. Retrieved from https://emotional-interfaces.com/. Screenshot of web page from 2020.

custom garden

[grey] thewrong biennale
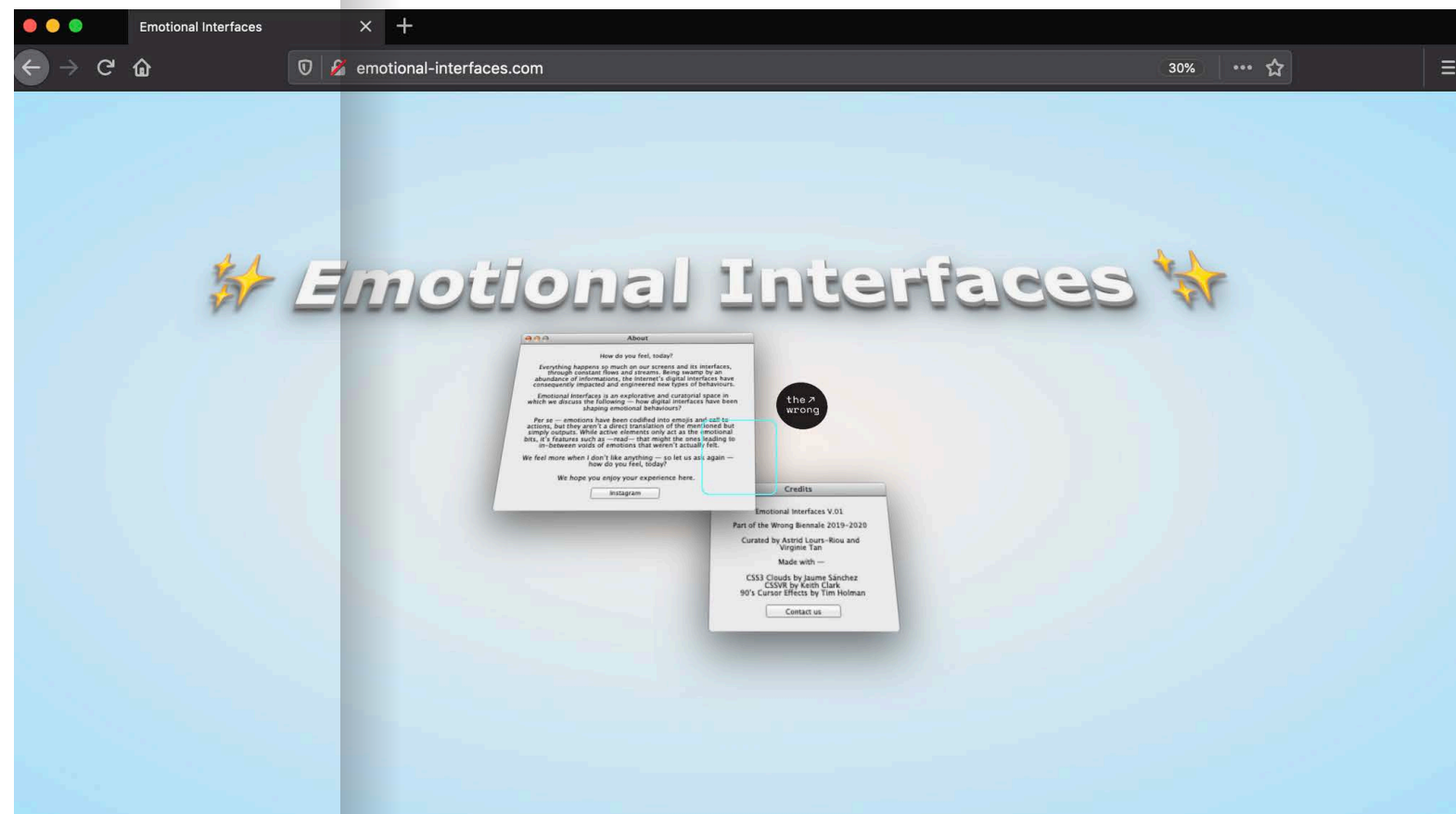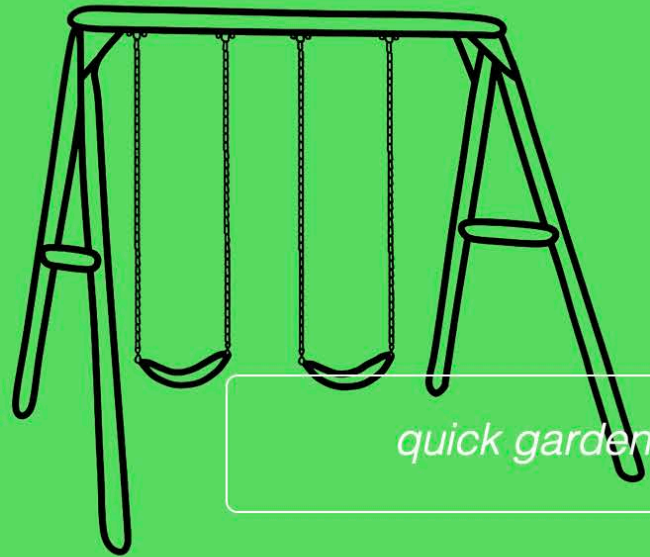
Figure 12: common.garden — Index Page (2020 -). Conceived by Constant Dullaart. Retrieved from https://common.garden/. Screenshot of web page from 2021.

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2020 Digital Odyssey:

ONLINE OR NOTHING

GAIA TEDONE

COVID-19 AS A GREAT EQUALIZER: REALITY OR MYTH?

The spread of COVID-19 at the beginning of the year 2020, put the whole world in a position of forced pause. For a short moment, the global pandemic presented itself as a great equalizer, forcing people across various geographies to reconsider and change their habits and behaviors. However, the social and economic costs of the pandemic did not spread evenly across the globe. Vulnerable people and communities were hit harder, and pre-existing social inequalities were reinforced. In this context, technology played a double role, acting as a social glue among geographically dislocated communities and people, whilst also rendering more palpable the so-called digital divide – a term which is used in the social sciences to refer to the gap between the information 'haves' and 'have-nots' and, more generally, to uneven access to technology and network infrastructures.

The pandemic has also emphasized another digital divide, the one between contemporary art and new media art. Claire Bishop used the term in 2012 (Bishop, 2012) to suggest that the overlaps between the fields of contemporary art and new media are rare and she presented the latter as a niche and specialized subfield of the former, with its own discourse, star system and network of distribution. Her opinion was widely criticized by new media advocates, who refuted the subordinate distinction of new media art to mainstream contemporary art and reacted against the proposition that code is alien to human perception. However, the fierce tone of the debate testified to the fact that these two fields indeed rely upon different systems of reference and cultural paradigms. A few years later, Bishop revised her argument in a book essay to include some of her later reflections on the subject. She chose a provoking title for her essay *Sweeping, dumb and aggressively ignorant!: revisiting 'Digital Divide'* (Bishop in Cornell & Halter, 2015), which she borrowed from a comment written in response to her original article.

As I have argued elsewhere (Tedone, 2019), the digital divide, originally diagnosed by Bishop in relation to the critical receptions of new media art, has also translated into curatorial practice, contributing to polarizing the positions of new media curators and contemporary art curators. This digital divide of curatorial practices can be understood both as a condition and a response to a number of different factors. First, the networked infrastructure and level of digital literacy which curators rely upon and have access to when conducting their projects and activities. Second, the different theoretical references and historical genealogies that make up the fields' intellectual discourses. Third, the different market dynamics which have an impact on the circulation of artworks and their sales, as well as the employability of curators inside both the academic and the museums' sectors.

Although this curatorial digital divide affects the so-called international art world globally, it can be more easily detected in those coun-

tries in which there is a lack of public funding and institutional framing for digital practices, and more generally a low level of digital literacy. For instance, Italy, which is the vantage point from which my observations take place, represents an interesting case in point in this respect. Whilst there is a small but vibrant community and network of practitioners when it comes to new media art, the institutional representation of new media art is sparse, which is reflected also in the absence of the work position of the digital art curator inside museums and galleries – a profession which is still largely unrecognized in the art and cultural sector. Consequently, the relationship between art and digital technology tends to be framed under the umbrella of "art communication" instead of, for example, digital programming; thus, the range of activities that involve anything digital inside the museums falls into the job description of "social media manager".

Beyond the idiosyncrasies of the Italian context, I want to argue more generally that the pandemic has paradoxically even scaled up the divide between the modes of curating of contemporary art and digital art, by causing a forced migration online of those mainstream contemporary art institutions which, up until that moment, had neglected the Web as a site of cultural production. Conversely, the new media art community reacted to the frantic and often banal online exhibitions and cultural events acceleration by quitting their online activities for a while to take a pause for reflection.

ONLINE OR NOTHING: THE CONTROVERSY

In the mainstream media the pandemic was described as an opportunity for the digital renaissance of the art sector, as a new era of digitalization of culture. For example, Laura Feinstein wrote the following statement in The Guardian published on the 8th of April 2020:

> *"The pandemic, incredibly, is ushering in a golden age of virtual media, making good on the initial promise of digital, while offering new life and unprecedented access to some of the world's cultural touchstones, some previously financially or physically inaccessible. While the world has never felt more physically isolated, digital media have offered a bridge, as well as an exciting range of experiences."* (Feinstein, 2020)

One needs to consider the set of examples the author used in support of her argument to fully understand my skepticism about this claim. More specifically, she used examples drawn from the mainstream contemporary art world to support her argument. Thus, for instance, the development of Online Viewing Rooms (OVR) in art fairs, such as **Art Basel**; or, of podcast series such as the one developed by the prestigious **David Zwirner Gallery** in New York. However, the article fails to acknowledge that there is a whole history of art practices intersecting with the development and application of networked and web technol-

ogies since the 1990s that is largely unknown to the general public. The perceived 'newness' of digital media in the art world the article alludes to, I want to argue, is thus only a matter of perspectives: of fields, histories, institutions or intellectual discourses. The point that the article seems to be proving is that in 2020 the contemporary art world and its market got finally interested in the digital. But how did this interest manifest, which new strategies and tactics were put in place and what institutional models were endorsed?

Reflecting upon the international example listed in the Guardian's article, Italian contemporary art museums, such as the **Triennale** in Milan or **Mambo** in Bologna, boosted their presence on social media, swiftly building new formats, such as podcasts, and created online displays of their exhibitions and collections. These online viewing rooms were often relying upon services such as the Google Arts & Culture Project, which provided swift solutions to the problem of translating the museum's identity online. However, it is important to bear in mind that that these services are not transparent interfaces, which is a condition that most museums have failed to acknowledge. As the digital curators Marco De Mutiis and Jon Uriarte have argued, Google's operations call into question serious issues about artwork reproduction rights and the monetization of audiences' attention as well as the redirection of online traffic from the art institution's websites to Google's platform (Uriarte & De Mutiis, 2021).

Overnight new digital-native institutions and initiatives were created on social media, which focused mainly on quick documentation of the experience of the pandemic. Some of them were based upon the aggregative logic of users generated content, like the case of the Instagram **CAM (The Covid Art Museum)** which was open for contribution of artworks under a specific hashtag such as #CovidArt or #QuarantineArt; other enterprises, such as the **CPM** (Covid Photo Museum), attempted to organize visual documentation of this historic moment by arranging photographs according to conventional curatorial templates such as thematic exhibitions, solo series, and commissions. Other projects functioned as quickly assembled visual archives aiming to reflect on such initiatives across the media and photography worlds as they were happening. This was the case for the Tumblr blog **Curating The Pandemic Image**, put together by Marco De Mutiis, digital curator for the Fotomuseum in Wintherthur.

A remarkable number of galleries and museums invited their online audiences to produce and circulate photographs of their remakes of historical paintings from their collections with domestic props to exploit the engaging power of social media. The phenomenon went viral following the widely popular Dutch Instagram page **Tussen Kunst en Quarantaine** (Between Art and Quarantine) created by Anneloes Officier, a 31-year-old communication specialist from Amsterdam. The account inspired the **Getty Museum Challenge**, as well as other similar museums' online endeavors, showing that the experience of art and its creation can be a distributed process.
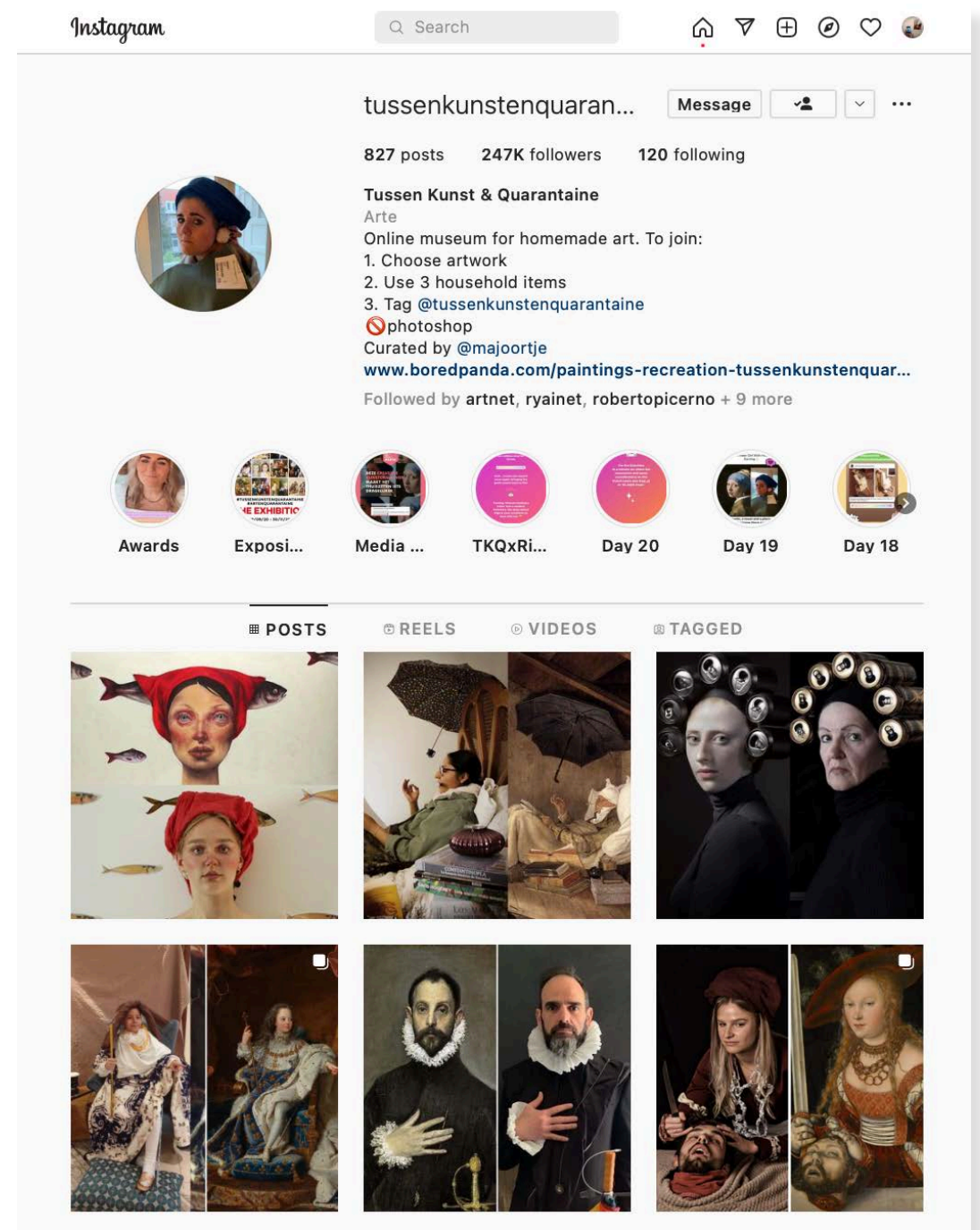

Figure 1: Tussen Kunst en Quarantaine. (2020) Retrieved from https://www.instagram.com/tussenkunstenquarantaine/?hl=en

WHO RAN THE DIGITAL REVOLUTION?

This digital awakening of the world of art and culture raised quite 'a buzz' within social media, especially amongst those commentators and Instagram pages that were already scrutinizing the contemporary art world, its elitism and erratic attitude towards digital and web technologies. Within the aesthetic flow produced by the pandemic, various tweets and memes circulated mocking the positions of galleries and museums with regard to establishing an online presence. Among the most effective examples was the Tweet published by technologist Barry Threw which stated *"The way to take your museum online is not to email a picture of something in your collection every day"* (Threw, March 24th 2020, Twitter post); or the post published by **Freeze Magazine**, an Instagram page mocking the famous art journal Frieze, posing the question *"Who led the digital transformation of art galleries?",* and offering the following responses in the form of a multiple choice list: *"A) Artists; B) Curators); C) Communications Teams; D) COVID–19"* (Freeze Magazine, April 20th 2020, Instagram post).

Zooming back into the Italian context, it was artist Giulio Alvigini who launched on his Instagram page **#makeItalianartgreatagain**, a video provocation that effectively captured the temperature of the moment on the 11th of March 2020 (Alvigini, 11.03.2020). Alvigini, whose artistic practice can be described as a memes-based institutional critique of the Italian art system, called out the Italian artworld and the museums sector for the phony enthusiasm and noise that was being produced with

regard to digital initiatives. He provoked art professionals by inciting them to *"have sex and watch the Simpsons instead of hypocritically congratulating each other for having woken up – with decades of delay – from a digital amnesia"* (Alvigini, 2020). The video caused a number of fierce reactions, yet it opened up discussion on the highly problematic attitudes of cultural institutions towards artists in such a complicated situation. He voiced a necessary argument, considering that the attitude of cultural institutions was beginning to appear highly problematic, particularly with regards to the exploitation of artists as unpaid content producers. Artists were in fact being asked to provide content for free in order to keep the online pages of museums and galleries live. This request from the side of institutions was rather distasteful considering the economic fragility artists had suddenly found themselves in. An Instagram post by curator Zoë De Luca published on the 19th of March 2020, summarized this problematic condition, pointing out that *"freelance artists and art practitioners in quarantine were not bored"* but rather *"were struggling*

jerrygogosian

I don't want to visit a museum virtually
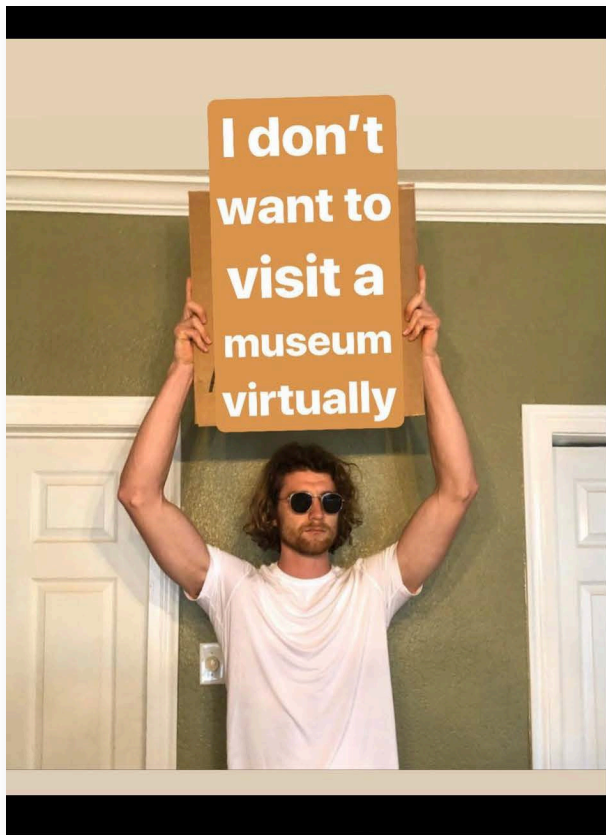
fraukegerhard NO MONEY NO HONEY
147 sett.   Rispondi

bobthetriceratops @polly_amethyst is right. this is keeping someone from loosing their job and adding to the growing number of art workers on unemployed. I can appreciate the satire. But let's not let social art criticism put someone else out without a paycheck.
I'll also take the virtual museum's as @aubreyroemer reminded, for those educators now teaching remotely who need this resource &! for those who could never afford to go to the brick-mortar locations to begin with.
Keep the virtual museum & demand the wealthy institutions & our representatives DO MORE
147 sett.   **Piace a 2 persone**   Rispondi   Visualizza traduzione

Visualizza le risposte (2)

Piace a **unorientable** e **altri**
MARZO 21, 2020

greencube.gallery

URL ISN'T ENOUGH

covid online events are lockdown propaganda

(we're **closed**: you don't need another crap online exhibition)

to figure out how to survive in the professional indeterminacy they will be facing in the next months" (De Luca, 2020) as numerous projects and jobs had to be postponed or even cancelled.

Oscillating between some accelerated aesthetic flows and some blatant institutional flows, the pandemic exacerbated the inner inequalities of the art worlds and their systems, as well as reinforced curatorial digital divides between traditional art institutions and digital art communities. In this situation, some international galleries and smaller-scale institutions specialized in digital art, which had already been organizing online exhibitions for decades, decided to define themselves against the mass exodus of art events online by stopping their activities on the web for a while. Instead, they often issued thought-provoking statements, such as for instance, gallery **New Scenario** in Germany which featured on its homepage the text *"due to the Corona crisis this website is closed until further notice"* (New Scenario, 15.04.2020). Or **Green Cube Gallery** suggested that it was better to do nothing at that times rather than to do something without thinking, as expressed through the following words on their website: *"URL ISN'T ENOUGH. Covid online events are lockdown propaganda (we're closed: you don't need another crappy online exhibition)"* (Green Cube Gallery, 02.10.2020).

What an account of these examples and statements reveals, is that online curators and digital galleries found themselves uncomfortable with the move of the traditional galleries and museums projects online. This is because the latter often misplaced the practice of online curating with that of broadcasting and live streaming, discarding the rich genealogy of digital art, and net art projects which had formerly been investigating and cultivating different kinds of creative engagements with the environment of the Web. This state of affair pointed to the problematic but widespread translations of the logic of the white cube and of the conventional exhibition formats to virtual spaces and online platforms. In other words, online viewing rooms were not to be seen, by default, as sufficiently creative responses to the systemic challenges brought about by the pandemic that the art world had to face. On the contrary, they provided only a quick fix to preserve a superficial engagement between institutions and their online audiences, calling into question the flirtatious relationship between galleries, museums and the attention economy as well as the more fraught relationship between galleries, museums and online cultural production. Additionally, the crisis caused by the pandemic and lockdowns revealed the inner flows of the whole art world system, since its main actors – artists and creative practitioners – were left with no safety net in a time of deep trouble. Fast forwarding to the present moment the words of Uriarte and De Mutiis read as almost prophetic:

"Cultural institutions might have increased their website traffic and gained new followers on social media over the pandemic but it is unclear, to say the least, how offering their audiences access to the #museumfromhome will help them to recover in the upcoming post-pandemic scenario which will see a reduction in tourism, funding struggles and likely an ongoing aversion towards indoor events. (…) The initiatives launched during the lockdown that will manage to remain and be relevant in the post-covid landscape will attest which of the institutional approaches – if any – has been successful in overcoming one of the greatest challenges that cultural institutions have ever faced." (Uriarte & De Mutiis, 2021)

In order to understand the implications of these considerations, it is important to address the skeleton in the closet, that is the fraught relationship between the museum and online cultural production. I want to argue that the Covid-19 pandemic exacerbated an earlier identity crisis of the museum, which has been struggling for a while to face the social, educational and aesthetic challenges brought about by the networked culture and to explore its creative and aesthetic potential.

THE SKELETON IN THE CLOSET: MUSEUMS & NETWORKED CULTURE

A brief excursus into the recent 'post-critical museology' (Dewdney, Dibosa & Walsh, 2013) would reveal that the Web has been approached by the majority of cultural institutions according to the following three types of logic: first, as a mere marketing tool for self-promotion and audience engagement; second, as a means to produce a universal archive for content; third, as the equivalent of social media, by *"framing the virtual visitor as an expanded audience and to a lesser extent the user as a generator of valued content"* (Dewdney, Dibosa & Walsh, 2013, p. 330). This state of affair has left little space up until now for the exploration of the creative
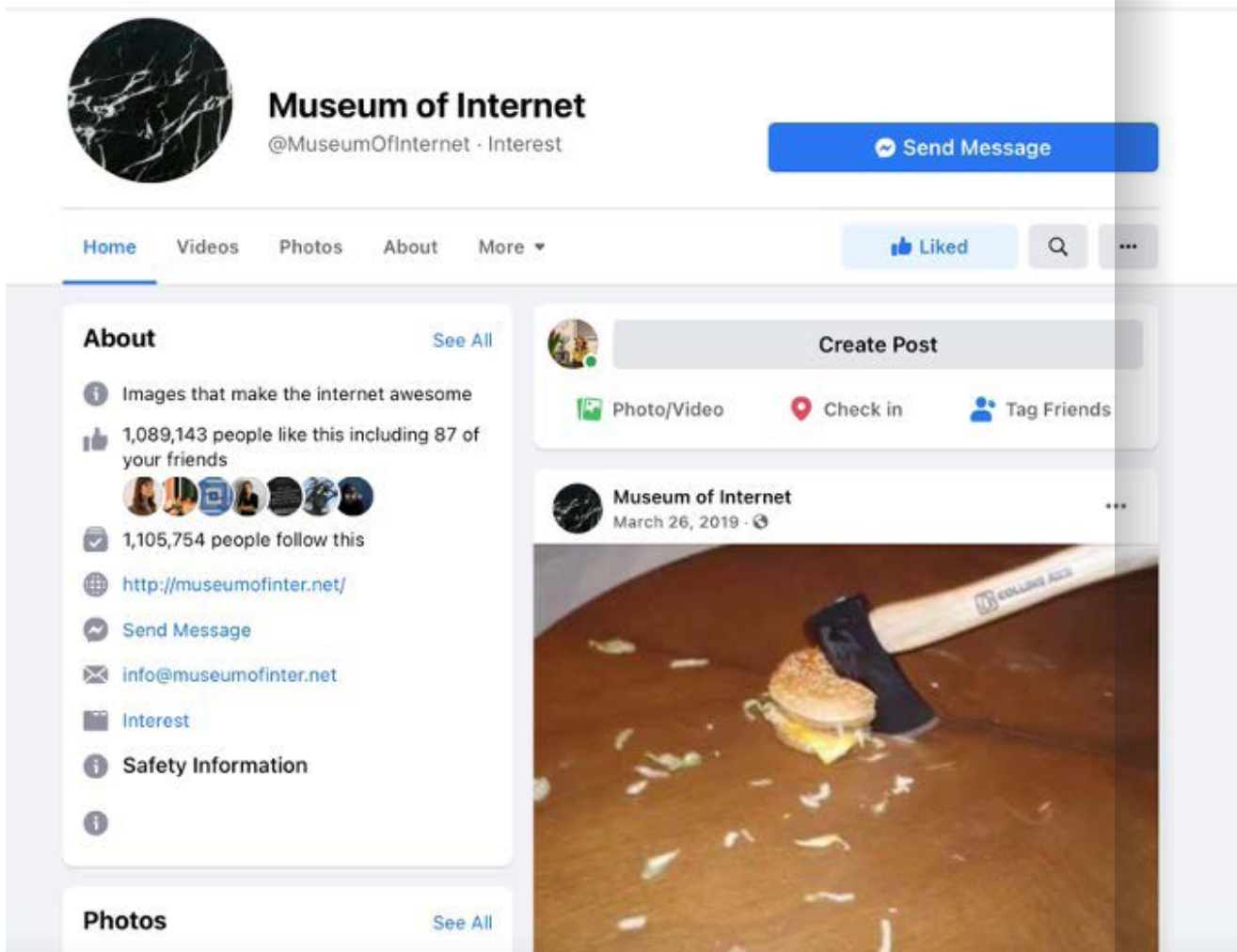
and aesthetic potential of the networked culture and its users. In other words, museums have generally approached the digital as a tool rather than as culture and thus have missed out the opportunity to engage with its aesthetic currents and to produce cultural value on the web, via, for instance, *"the moderation of intelligent and nuanced conversations online"* (Cornell, 2017).

Historically, the lack of understanding of networked culture from the side of the museums has left a void which artists often have filled creatively, by taking up the role of curators or museums directors. This was the case of the **Museum of Internet (MoI)**, an online project run by French artists Félix Magal and Emilie Gervais from 2012–2019 on a Facebook page which collected and archived the "temperature" of the Internet at that time, via a stream of networked images, memes and gifs (more about it in Tedone, 2022). Responding to the lack of institutional interest for Internet culture on the Parisian art scene, Magal and Gervais built their own museum in the form of a Facebook page *on* the Internet and *about* the Internet, collecting and archiving the flow of content representative of the time of the Web 2.0. Outside of the context of the platform the museum existed simply as a folder, containing *"a lot, lot, lot of memes"* (Magal, 2019). Inside of Facebook, the museum was a content feed of networked images posted and streamed daily, which captured the aesthetic currents and the online iconography emerging around the 2010s. The history of MoI was bound to the specific human-technical assemblage of its hosting platform. In fact, Facebook guidelines regulated and moderated the project's aesthetic currents and set the limits of MoI's collection – no nudes, no hate speech, no violence. As a museum, MoI was indeed quite atypical. It featured no exhibition and refused curatorial authorship and stardom, as Magal and Gervais decided to remain anonymous. It provided no mediation and no interpretation since memes were shared without content and captions. Instead, MoI chose to give prominence to its content and users, exercising a form of radical 'communality' (Stalder, 2018) with the aim to democratize aesthetics. As a result, the operation demonstrated that the network is already in the museum by virtue of its audiences (Dewdney, 2019). In other words, the project celebrated Internet art, or more precisely, it celebrated Internet as art, and thus art as a potentially accessible, participatory and humorous event and practice. Throughout the process, MoI grew a community of over one million followers spread across more than hundred countries.

Yet, there is something particularly revealing about this project being called a 'museum'. For Magal, the title of the project played to a certain collective perception that he felt compelled to address for two contradictory reasons: on the one hand, in his view, kids who are interested in Internet culture tend to avoid going to museums. On the other hand, museums do not understand the Internet and are often skeptical to embrace online culture. This can be considered somehow paradoxical, as the Internet is continuously producing a new aesthetics and there is no place where to archive it, whilst museums approach *"the potential of*

the web to produce a universal archive, cast as digital heritage" (Dewdney, Dibosa & Walsh 2013, p.330). Gervais also speculated on this conundrum when she observed:

> *"Too bad museums are always late and getting on with stuff once its history. I often wonder if it is that way because they want to make sure the general public is following them or because they need to have an historical point of view on things once they can grasp it as an actual thing."* (Gervais, 2019)

The MoI project's denomination and its archival mandate suggests the urgency of narrowing the divide between the museum and networked culture and points to the necessity of reassessing the very premise of the museum's mandate, starting from its formats and operations. Under this light, what arguably presented itself as a discrete, almost accidental and light-touch artistic operation, provides today a valuable insight when assessing the complicated relationship between the museum and networked culture. Even before the pandemic, this relationship was already being challenged by the widespread use of social media as platforms for art documentation and the parallel outburst of museums of various kinds, such as the **Museum of Ice Cream**, designed with the intention of acting as stage sets for the production of selfies and for brand engagement. As artist and writer Dena Yago argues, what can be defined as a cultural experience has expanded greatly over the last decade, as something increasingly defined by the eye of the individual user rather than by the mandate of the cultural institution. This bears some important economic consequences, since, as she states, *"the social media feed has flattened any experience into content that is immediately shared on centralized platforms, such as Instagram or TikTok, where that content profits the platforms, not the content creator"* (Yago, 2022, p.111). How the museum is enmeshed within such a complex ecosystem is a question which would require further scrutiny and a self-reflexive engagement from the side of the cultural institutions themselves.

In spite of the museums' fervent engagement with social media during the pandemic, it was rather surprising that no cultural institution attempted a systematic operation of archiving the richness and variety of memes and visual content that was created and exchanged by users worldwide during the lockdowns via WhatsApp chains and social media platforms. Such a task was left to be uncovered by research institutes and academic projects which identified social value in these forms of cultural production, pointing to the agency of creativity and humour in a time of crisis (see Giselinde Kuipers & Mark Boukes, 2020).

As the aesthetic current of the global pandemic began to decelerate in early 2021, another strong participatory wave surfaced: the phenomenon of the Bernie Sanders meme and the virality of the site **Bernie Sanders goes place**. This was a particularly interesting case not only for its spread and the kind of performativity it produced – a truly networked performance

with a wild geotagging flavor – but also from the resilience shown by the public figure whose image was being curated. Sanders benevolently accepted the spotlight and reclaimed his own image only for the greater good: to raise $1.5 Million in support of Vermont Charities through the sale of his line of meme merchandise. How come, then, that museums remain largely indifferent to these aesthetic currents and their wider social and political implications? How can these aesthetic currents be redirected to produce new forms of cultural value?

As I have argued elsewhere (Tedone, 2022), the answer to these questions considers two distinct yet interrelated factors, both of which are a consequence of the unresolved clash between the old paradigm of aesthetic modernism (Dewdney, Dibosa & Walsh, 2013) and the current conditions of online circulation and "circulationism" (Steyerl, 2013) that characterize the dissemination of content on the Web: first, the difficulty for the galleries and museums to radically rethink the notion of aesthetics; second, the resistance to reimagine its categorical distinctions, as well as its curatorial formats and the whereabouts of its operations.

The theories put forward by new media theorist Olga Goriunova are very useful for reframing aesthetics as simultaneously a practice in a constant process of becoming, whose very constitution is being changed by networked technologies and as a *"major mode of operation for contemporary society"* (Goriunova 2012, p.94). To acknowledge this expanded definition of aesthetics, I would argue, is the first step for rethinking the role of the museum within networked culture and for framing online curating as a processual and networked practice that transcends the traditional category of art – what Tyzlic-Carver refers to as "not-just-art-curating" (2017) – in order to embrace a more fluid and inclusive notion of creativity.

GLIMMERS OF HOPE: TOWARDS NETWORKED CO-CURATION

Several initiatives were set up during the pandemic at both ends of the curatorial digital divide, that pointed to the possibility of approaching online curating as a distributed, collaborative, networked and performative process and practice. In other words, as networked co-curation: a process forging strategic alliances between different agents (both humans and machinic), objects (art and mundane objects) and practices (independent and institutional curating, hacking and commercial endeavours) and that aggregates each time a specific constellation of relationships (Tedone, 2019, Dekker & Tedone, 2019).

One of such initiatives was the 48 hours live streaming of the work by artist Arthur Jafa entitled **Love is the message, the message is death** (2016) initiated by the Smithsonian American Art Museum, the Hirshhorn Museum and Sculpture Garden in consultation with the artist. Thirteen art museums and collections around the world, each of which holds an edition of the artwork in their collection, were gathered to orchestrate a simultaneous streaming of the work to make it accessible to the broad-

est possible audience. Although the curatorial operation can be described simply in terms of live broadcasting, the museums network it created and the political undertone of the work, which denounces ongoing police violence and racial oppression faced by Black Americans, produced a remarkable impact, reaching an audience of 125.000 people across different time zones. Viewers were encouraged to submit questions and reactions to the video online, responding to the preposition that museums can be safe spaces for difficult conversations (Stebich, 2020).

Another effective use of online infrastructure was conducted by the Chronus Art Centre in Shanghai in occasion of the online project curated by Zhang Ga entitled **We=Link: Ten Easy Pieces** (2020). The project was a direct and swift response to the lockdown in China in the early year 2020 and was made possible by the participation of two additional international institutions, the Art Center Nabi in Seoul and Rhizome in New York, which contributed the budget to commission artists and organize the show. The project aimed to reaffirm the importance of Net art as a practice which responds to the infrastructure of the network. The dispositif of the 'link' was used as a central device in the experience of the online exhibition. Artists of various backgrounds were involved in the project, merging in this sense Bishop's art digital divide and aimed at creating a community of solidarity and a network of empowerment across creative practitioners in a moment of profound crisis. The role of the curator Zhang Ga, who works across both the contemporary art world and the media community, was key in narrowing the curatorial digital divide. When asked to comment on such a divide, Ga speculated that the problem consists essentially in a knowledge gap from the side of the contemporary art world and that the solution might lie in deeper understanding of the intricacies of technology from a practical perspective as well as from a philosophical one, and a better integration of these two communities of stakeholders. The project We=Link evolved into an ongoing programme, a platform for presenting online art, with a second exhibition entitled **We=Link: Sideways** (2020–2021) which integrated both the online space and the physical environment of the gallery.

In another case, two international museums decided to join forces to create a brand-new curatorial format. The programme of **Screen Walks** (2020) was conceived by the digital curators of The Photographers Gallery in London and Fotomuseum Winterthur Jon Uriarte and Marco de Mutiis. This online format, which relied upon the video conferencing platform Zoom, used the devise screen sharing as a mode of entry into an artistic and creative practice, enabling artists and researchers to open the black box of their computers and to blend the boundaries between a studio visit, a networked performance and an online workshop. Various practitioners, such as artists, curators, researchers, were invited to creatively respond to the possibilities and limitations offered by this format and by the technology enabling it. When asked to participate in the programme, I took the opportunity to collaborate with Cuban artist Nestor Siré and to stage several blockages Cuban users experience in their daily navigation

of the Internet, starting with giving visibility to the difficulty of connecting to Zoom at the time of the event. The Screen Walk thus became an opportunity to circumnavigate problems of access and connectivity and to explore alternative ways for engaging with online audiences.

These examples reveal that, when technology is treated as 'culture' and the logic of cooperation combined with techno-social alliances replace cultural gatekeeping and single authorship, it is possible to begin rethinking the role of the museum in networked culture as a node within a much wider constellation, or ecosystem, shaped by human and non-human agents, software, images, and users. In this context, the museums should approach online curating not merely as a counterstrategy to conventional models of curating, but as a way to stage synchronic participation and interaction with audiences, connecting distant geographies and different socio-technical conditions. Through this formulation, the museum could become an active participant in processes of networked co-curation, creating a de-centralized and collaborative alternative to the dynamics of hyper-individualism and cultural gatekeeping that are often at the core of current art world systems and social media platforms.

Overall, the pandemic taught cultural institutions a number of important lessons, some of which might take years to be fully comprehended. One of the most important ones, was to gauge how the Web operates as a catalyst for various art communities and audiences, which rarely interact with one another, and to point to the necessity for a deeper integration between them which could be potentially conducted by progressive museums. The knowledge gap identified regarding network technology could be overcome through sharing resources consistently and literature about the history of Net art and digital art practices. Or, additionally, through the creation of novel training programmes for cultural operators which could integrate technical and computational studies inside the curriculum of humanities. Concerning the role of the museums more specifically, it has become apparent that the process of recasting a new social role for them should start from a self-reflexive evaluation of how art and creativity are imbricated within the wider dynamics of the attention economy as much as the creative exuberance of the networked culture. In this respect, there are still many avenues that museums can explore to redirect the aggregative power of online platforms towards radical forms of communality, solidarity, and participation in concert with online audiences.

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NETWORKED ART PRACTICE AFTER DIGITAL PRESERVATION

SARAH COOK
RODDY HUNTER

Over the last six decades, networked art practices have evolved in response to and in anticipation of changing material conditions of communications systems, infrastructures, and technologies. Whether pre-internet correspondence art, or born-digital software-based, or net art, the material and, at times, ideological dimensions of networked art challenge existing approaches, methods, and protocols of not only the production of contemporary art but also its conservation, which this text seeks to address. Often tactically amorphous, integrated, and inseparable from conditions and questions of (im)materiality (see Lillemose, 2006), networked art resists conservation efforts to trace its edges and boundaries. Therefore, how and should we develop conservation efforts to offer access to the 'original' work in context without undermining its unruly materiality and institutional critique, particularly *after the digital*? Whether these efforts are called 'conservation' by museum curators, or 'preservation' by librarians and archivists, they share the same intent: making the work accessible. In the words of Peggy Phelan this *"labour […] to 'preserve' [performance] is also a labour that fundamentally alters [it]"* (Phelan, 1993, p. 148). This labour further compounds the challenge of identifying the edge or boundary of the networked artwork to draw a line around it for its conservation. As apt as Phelan's observation is related to the immediacy of performance, its applicability endures with increasing urgency in terms of the performative hypermediacy of networked art practice.

Due to, rather than despite, this tension, we seek to trace the edges and boundaries of preserving both pre-internet and born-digital networked art practices. Focusing upon artworks that draw on distribution networks (such as the postal system and the internet) as their primary medium of production, we aim to unpack existing digital preservation efforts concerning online and offline exchanges. Our findings emerge from investigating possible approaches to **6 Months Without** (Nastja Säde Rönkkö, 2018–2019) and the **Museum of Ordure** (Stuart Brisley, Geoff Cox, Adrian Ward and Maya Balgioglu, 2001–onwards) as case studies. In so doing, we also tackle the present and future implications of using web archiving tools [such as the Internet Archive's **Wayback Machine** (1996–onwards)] as a preservation strategy and how they might impact artistic and curatorial agency and authorship.

NETWORKED ART: WHAT, WHERE, AND HOW?

We take recent works of art as a point of departure to survey a range of issues, challenges, and opportunities regarding networked art practice after digital preservation. Where and how does networked art happen, and how is that defined? Many of these artworks exhibit hybridity, performativity, ephemerality, dissolution, proliferation, and even auto-destruction. These *"work-defining"* properties as Pip Laurenson calls them (Laurenson, 2006) make networked art challenging to define and preserve. However, we can also observe ways in which networked art itself can be accumulative or built on repositories, even creating archives of ongoing interaction and participation as the focus of the work itself. The appropriative and generative nature of networked art critiques notions of originality, uniqueness, and materiality after digital reproduction. Networked art can even behave, somewhat ironically perhaps, as a form of digital preservation and act of media archaeology. In other words, preserving networked art can become a form of production of new work. Archivist Sarah Haylett has investigated this in the context of artworks which, through conservation and exhibition, generate their own archives (Haylett, 2022). The challenge is bringing existing approaches, methods, and protocols into alignment: the preservation of networked art will require libraries, archives, and art museums to share knowledge, and skills around preventive conservation, recordkeeping, and archiving.

Networked art's cardinal principle of peer-to-peer distribution as its primary means of co-production and circumvention beyond institutional curatorial

spaces makes it singularly relevant to our contemporary social, cultural, and political experience. As such, networked art, particularly web-based and internet art, has become increasingly attractive to major contemporary art institutions. The exhibition **The Art Happens Here: Net Art's Archival Poetics** (2019) at the New Museum and the accompanying online portal, *Net Art Anthology* (Rhizome, 2016/2019), is such an example. The project takes its title from MTAA's *Simple Net Art Diagram* (1997) (<u>Figure 1</u>), which concisely articulates networked art practice as a performative, live encounter or exchange within relational space.

So, where and how does networked art happen? Does the art always happen 'in between' as the MTAA diagram suggests, or if "The Address is the Art" [as mail artists Marc Bloch, Mark Pawson, and others have stamped (Ochone, n. d.)], can the location or coordinates of that inter-action align with a URL? Taking our working definition of networked art as *artworks which draw on distribution networks as their primary means of production*, what might this mean for works such as Miao Ying's **Blind Spot** (2007), a Mandarin dictionary annotated to remove censored search terms on google.cn?

Or a work such as Émilie Brout and Maxime Marion's **Nakamoto (The Proof)** (2014) (<u>Figure 2</u>) which documents the artists' unsuccess-ful attempt to use bitcoin to buy a fake passport for Satoshi Nakamoto, the alleged creator of Bitcoin, over the darknet.
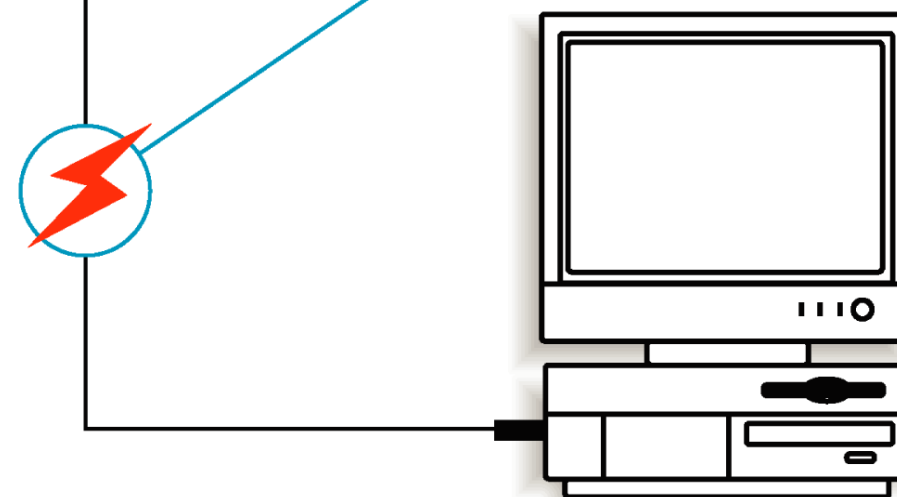
Simple Net Art Diagram

The art happens here

MTAA ca. 1997

CONSERVATION CHALLENGES OF NETWORKED ART, BEFORE AND AFTER THE INTERNET

Conservation challenges exist in the curatorial reproduction of networked art practice before and after the Internet. Consequently, as Zach Blas comments, *"untangling the relation or the collapsing of 'Internet' and 'network' whereas the Internet can be understood as being comprised of networks, but the network is not Internet"* (Blas, 2016, n.p.) is essential. For example, Robert Adrian's **The World in 24 Hours** (1982) *"connected artists in 16 cities on three continents for 24 hours between 12:00 noon on September 27 to 12:00 noon on September 28, 1982 (Central European Time) as part of the Ars Electronica 1982"* (Grundmann, 1984, p. 86). Critic and theorist Josephine Bosma has researched the work's possible re-enactment strategies, even *"involving a new generation of artists and various alternative network practices"* (Bosma, 2017, n.p.). Presenting this research within the context of digital art preservation discussion at *SHA2017* (*Still Hacking Anyway* – a hacker camp in the Netherlands), Bosma discussed the project as a way of addressing the susceptibility of computer network art to become lost. The analogue materiality of **The World in 24 Hours** accentuates this susceptibility, as does its hybrid platform-as-artwork ontology, whereby the work is intended to serve as an interface for artistic telecommunication on a global scale, ten years prior to the widespread adoption of web browsers.

    The World in 24 Hours is an artwork that happens between exchange and transmission, creating a network-as-artwork and vice versa. Bosma considers how to resituate the work's analogue communications technologies, such as Slow Scan TV, in the contemporary digital, post Web 2.0 media environment as central questions and issues to address in any future re-enactment. This focus reminds us of the restricted access to telecommunications media in the 1980s and the scale of ambition involved in mounting **The World in 24 Hours** as a networked planetary event. Bosma's research seems to be as much about re-enacting the technical capacity of the I. P. Sharp Associates Network (1982) (Figure 3) as it is about re-enacting the platform on which and through which **The World in 24 Hours** works, at least as much as it is about re-enacting the artistic exchanges that happen through the network because they are so deeply connected.

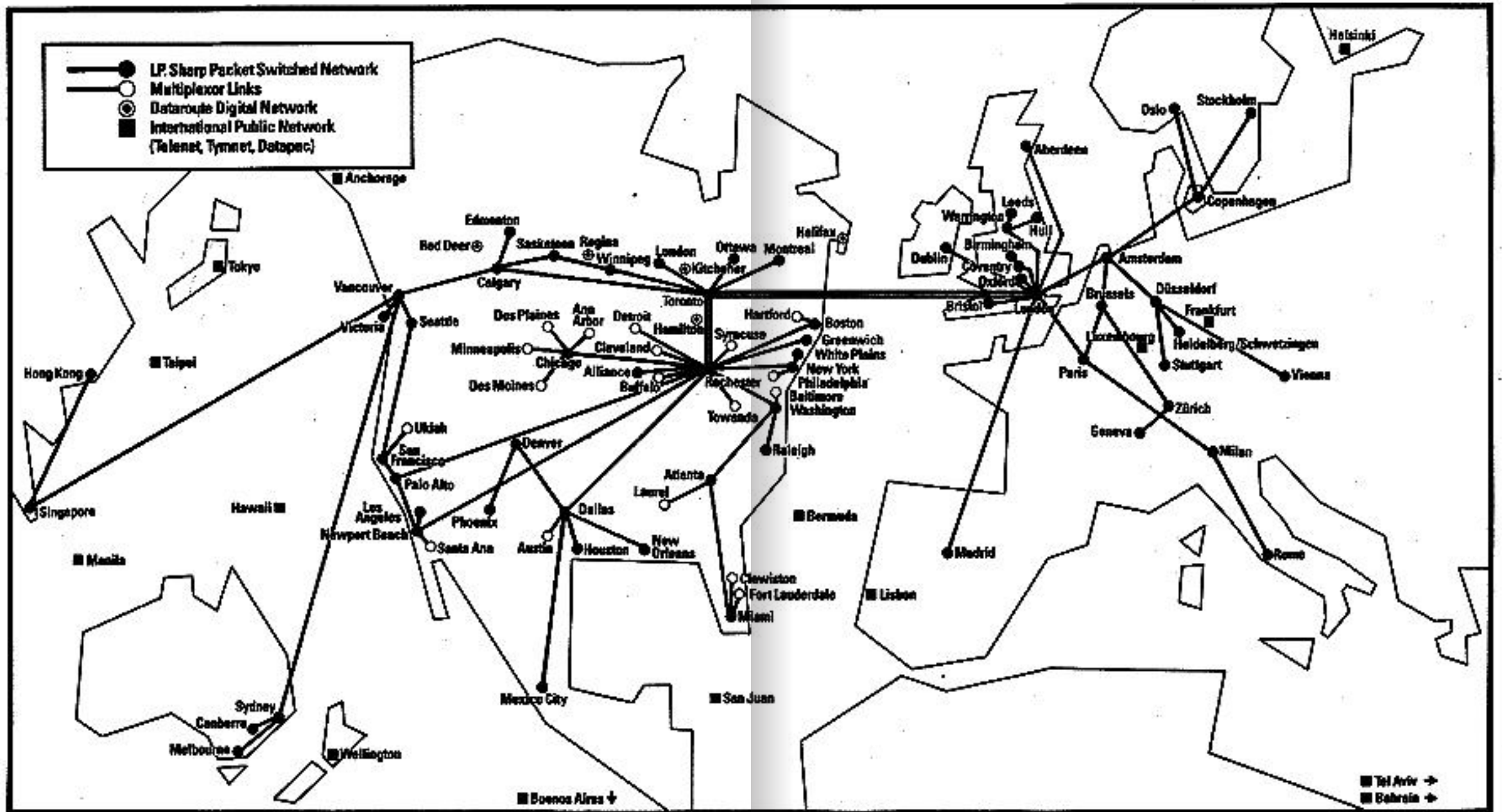Figure 2: Brout, É & Maxime, M. (2014). *Nakamoto (The Proof)*. [Passport Scan]. Retrieved from https://www.eb-mm.net/en/projects/nakamoto--the-proof.

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Figure 3: Artists' Electronic Exchange Program (ARTEX). (1982). *I.P.SHARP APL Time-Sharing Network*. Retrieved from http://alien.mur.at/rax/ARTEX/ipsamap.html.

As is often the case with networked art practices, the context of the work and its outcomes are indivisible. Recovering a decentralised analogue network apparatus in a contemporary world of distributed digital transmission amounts to a purposeful or even wilful refusal of practicality, expediency, and convenience. In light of the political nature of the digital in the post-Snowden era, Bosma addresses the possibility of refusing or circumventing modern social media platforms. She discusses the possibility of looking at outmoded technology such as ham radio, etc., in an effort to retain autonomy from the surveillance capitalism of the control society.

How the analogue materiality and hybrid ontology of **The World in 24 Hours** challenges conservation efforts is not unusual. Other networked artworks go further still in engaging material and ideological strategies to deliberately obstruct conservation, such as Heath Bunting's **Own, Be Owned Or Remain Invisible** also known as **_readme** (1998–onwards). Bunting's work is a canonical work of early net.art and, as such, was included in the exhibition **Electronic Superhighway** (2016) at Whitechapel Gallery.

"After copying a randomly selected magazine article onto his Web page, Bunting modified the article so that each word of written text becomes a hyperlink to itself. For example, the word 'is' links to www.is.com, 'on' inks to www.on.com, 'together' links to www.together.com, and so on. The selection of links is not meaningful—some words have been bought as Internet addresses while other words remain inaccessible. As a Web page _readme is nothing but links to other places; it is an aestheticization of protocol as such." (Galloway, 2004, p. 225).

Of the many accounts of the work, we prefer this description by Alexander Galloway, who goes onto remark that Bunting's **_readme** *"focused on a total dissolution of the art object into the network"* (Galloway, 2004, p. 225). This dissolution emphasizes the permeability of the digital object within its network context, in contrast to the opaque physicality of the analogue object.

WHEN PRESERVATION BECOMES PRODUCTION: APPROACHES, METHODS, AND PROTOCOLS OF NETWORKED ART PRACTICES

We are interested in speculating about how the material conditions of digital preservation reflect and influence the contemporary production of networked art practice. By this, we mean moving beyond the established narrative of attempting to digitally rescue and restore fragments of modernist, avant-garde destruction and decay. Far from deliberately resisting collection and conservation, we consider a tendency in contemporary
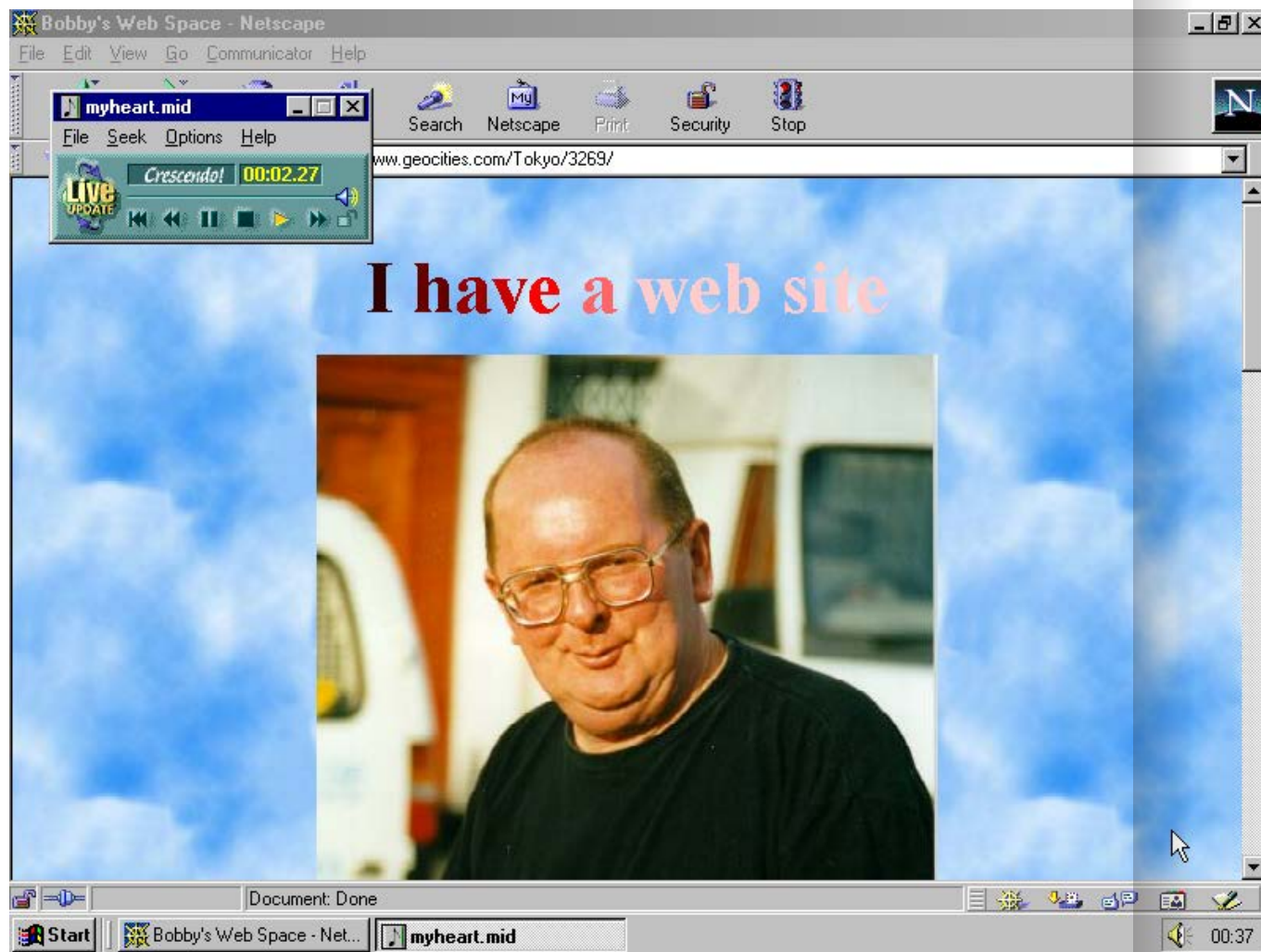
Figure 5: Espenschied, D. & Lialina, O. (2013–ongoing). I have a web site from *One Terabyte of Kilobyte Age Photo Op*. [Restoration of GeoCities web page, Screenshot, 2013, Netscape 4.51 on Windows 2000]. Retrieved from https://anthology.rhizome.org/one-terabyte-of-kilobyte-age.

networked practice to operate as a form of digital preservation or media archaeology, where artists shift to curatorial roles where in turn they excavate networked media processes.

Evidence of such works was present in Rhizome's **The Art Happens Here: Net Art's Archival Poetics** show, such as Morehshin Allahyari's re-production of 3D-printed replicas of artifacts destroyed by ISIS in her work **Material Speculation: ISIS** (2015-2016) (Figure 4) or Olia Lialina and Dragan Espenschied's **One Terabyte of Kilobyte Age** (2010–ongoing) (Figure 5), which preserves and appropriates Geocities websites as "assisted readymades".

Curators have long been implicated in the preservation of art through their own productive practices, insofar as exhibition-making offers a significant contribution to the preservation of the art it displays. The art history of networked art continues to rely on survey exhibitions. The history of new media art exhibitions, including **The Art Formerly Known as New Media** (Dietz & Cook, 2005), **Open Systems** (de Salvo, 2005), **Electronic Superhighway** (Whitechapel, 2016), **The Art Happens Here** (Connor et al, 2018), has been influential in excavating and representing artworks at risk of disappearance. Aside from exhibitions, however, there are several different ways networked art practices are conserved and made accessible, whether or not they are preserved. These include Patricia Norvell's interviews with conceptual artists (Norvell, 2001) and Charlotte Frost's work on preserving **Mailinglist culture** (Frost, 2019). These explorations involve uncovering networks used by artists and then thinking through how that material documents the artist's intent, if not the work of art itself. Art conservation draws on different models in this respect, such as Renee van de Vall's thinking on the artist's biography and the materiality of the work (van de Vall et al., 2011), Brian Castriota's writing about the identity of an artwork (Castriota, 2019), Glenn Wharton on the artist's intention (Wharton, 2006), and Hannah Hölling's idea of *"relative durations of impermanence"* (Hölling, 2016) in thinking about the artist's intent as being relative to a particular period of time.

There are a variety of models and themes at play within the domain of online preservation. These include thinking about instantiation, the moment when the work comes into being on the web, and digital curation as a machinic process which can be enacted by technical tools and applications, which the Digital Preservation Coalition has been exploring (Digital Preservation Handbook, n. d.). Annet Dekker's concept of 'networks of care' is central to this thinking (Dekker, 2020). Dekker's accomplishment is in incorporating unusual conservation strategies into a framework of practice.

The practice of networked art conservation has been aided considerably by the invaluable work of *Rhizome*, not only in developing preservation approaches such as *Net Art Anthology* but also in their parallel engagement with archiving the live web – initially through **Webrecorder.io** (2015–2020), renamed in June 2020 as **Conifer** (2020–onwards). While Conifer adds a new dimension of capturing user-driven interactions

with webpages rather than only a static snapshot of the page itself, the 'Internet Archive's Wayback Machine (1996–onwards) continues to be an invaluable resource for curators seeking to research and restage online networked artworks whereby archival preservation offers different approaches, methods, and protocols . Where recordkeeping generates documentation, archiving organises those records, then preservation also involves making them accessible. These various models of documentation practice include Joanna Phillips' work on recording differences between an artwork's score and multiple iterations as time-based art (Phillips, 2015), or providing access to a variety of records exemplified by born-digital artworks such as the *Net Art Anthology*. Preventive conservation is also relevant (Besser, 2014), which includes keeping track of infrastructure and environmental problems on a micro and macro scale, and *"post-custodial archival methodology"* (Ham, 1981), through which archivists *"ensure the integrity of, preserve, and provide access to archival materials without taking physical custody over them"* (Bliss, 2019).

This methodology can be facilitated through Open Archival Information Systems – archives in which networks of people and systems work together to preserve information and keep it accessible (Wikipedia: OAIS, n.d.). Whether involved in commissioning work or assisting in its restaging, curators play a role in conservation efforts as part of a network of care. The importance, however, is to understand which element of the work or its context is best preserved according to which model, for example, which part benefits from being scored or being migrated, and which parts need better documentation or new records created.

In the second half of this chapter, we will look more closely at two case studies, Nastja Säde Rönkkö's **6 Months Without** (2018–2019) and the **Museum of Ordure** (2001–onwards) founded by Stuart Brisley, Geoff Cox, and Adrian Ward and involving Maya Balgioglu and curator Rosse Yael Sirb and report back on the challenges these networked art projects present from a variety of perspectives.

Case Study: 6 Months Without
An interest in applying an expanded definition of networked art practice informed our selection of Nastja Säde Rönkkö's **6 Months Without** (2018-2019) as a first case study for research.

In her performance, the artist disconnected from the Internet for six months, during which time she lived entirely offline. All aspects of her life, including personal and professional communication, navigating London, socialising, connecting with people and working all took place without the Internet. From her space at Somerset House Studios, Rönkkö led seminars and workshops, while people could reach her by letter, phone calls or visiting the studio. In that sense, the work became a correspondence project, producing documentation of life without relying on the Internet.

From 1 October 2018 until 31 March 2019, the work was a multifaceted performance of everyday life, minus the online dimension. It was captured as a documentary film, email and postal correspondence, audio recordings of the artist's reading the letters, workshops with guests sharing offline time, and all the physical evidence of navigating the world during six months without the internet (Figure 6).

6 Months Without was part of the group show **24/7: A Wake-Up**

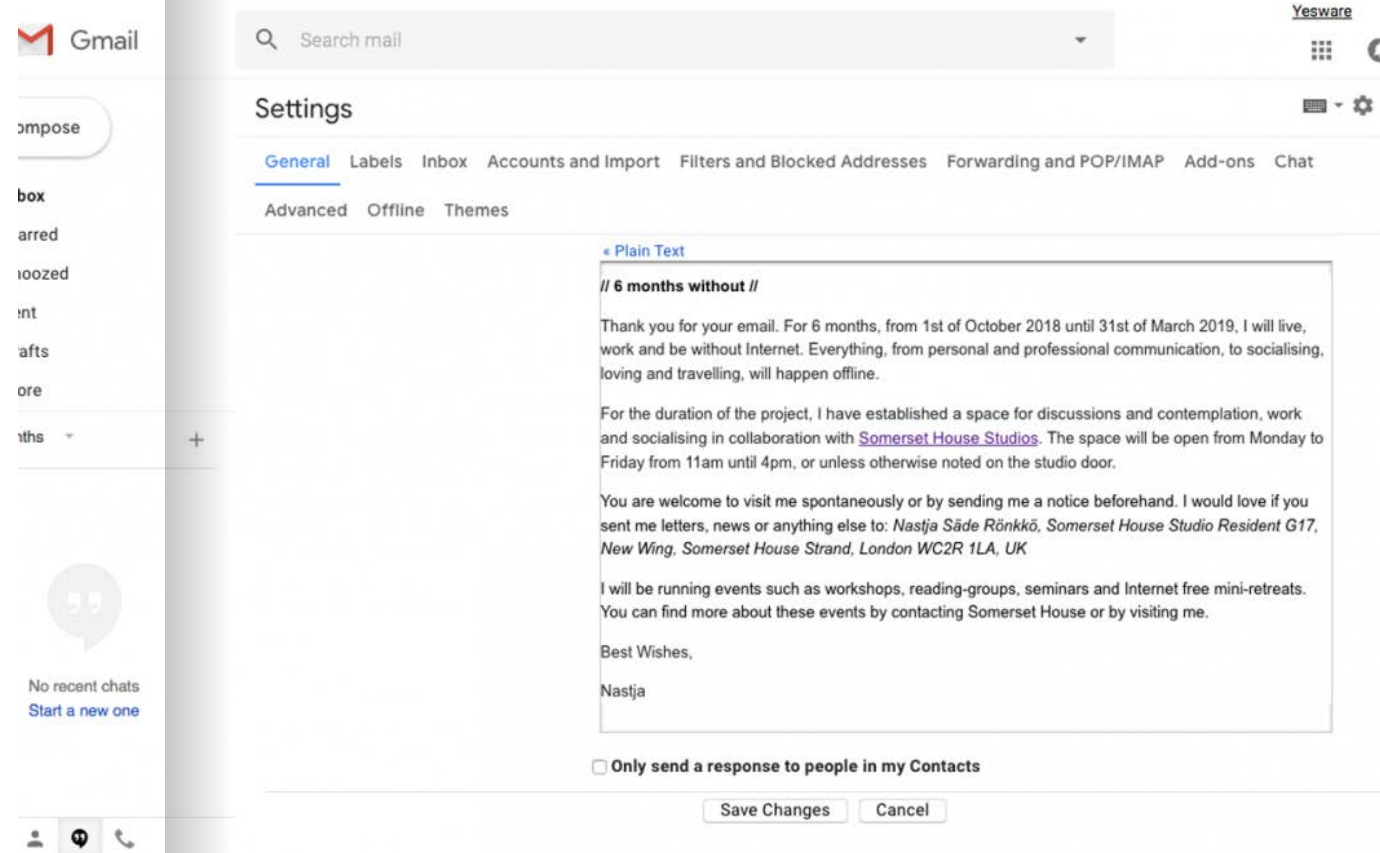Figure 6: Rönkkö, N.S. *Out of Office Autoreply* from *6 Months Without* (2018–2019) [Screenshot].

Rönkkö, N.S. *6 Months Without* (2018–2019) artist's correspondence, in the exhibition 24/7 at Somerset House, 2019. Photo (c) Tim Bowditch

Call for our Non-Stop World, which ran between October 2019 and February 2020 (co-curated by Sarah Cook for Somerset House, Cook, 2019). Additionally, on the artist's website, there are two video works exploring the performative experience of these six months offline, and the abundance of correspondence the project generated.

Documenting the artist's experience of living for six months without the internet, **6 Months Without** is an expanded performance engaging artistic, social, and technological network practices differently at each stage of its production, distribution, and reception. The work articulates the extent to which networked cultural experience and knowledge production has become ubiquitous as its platforms providing the interface of much of our social relations. Networked artists once built bespoke

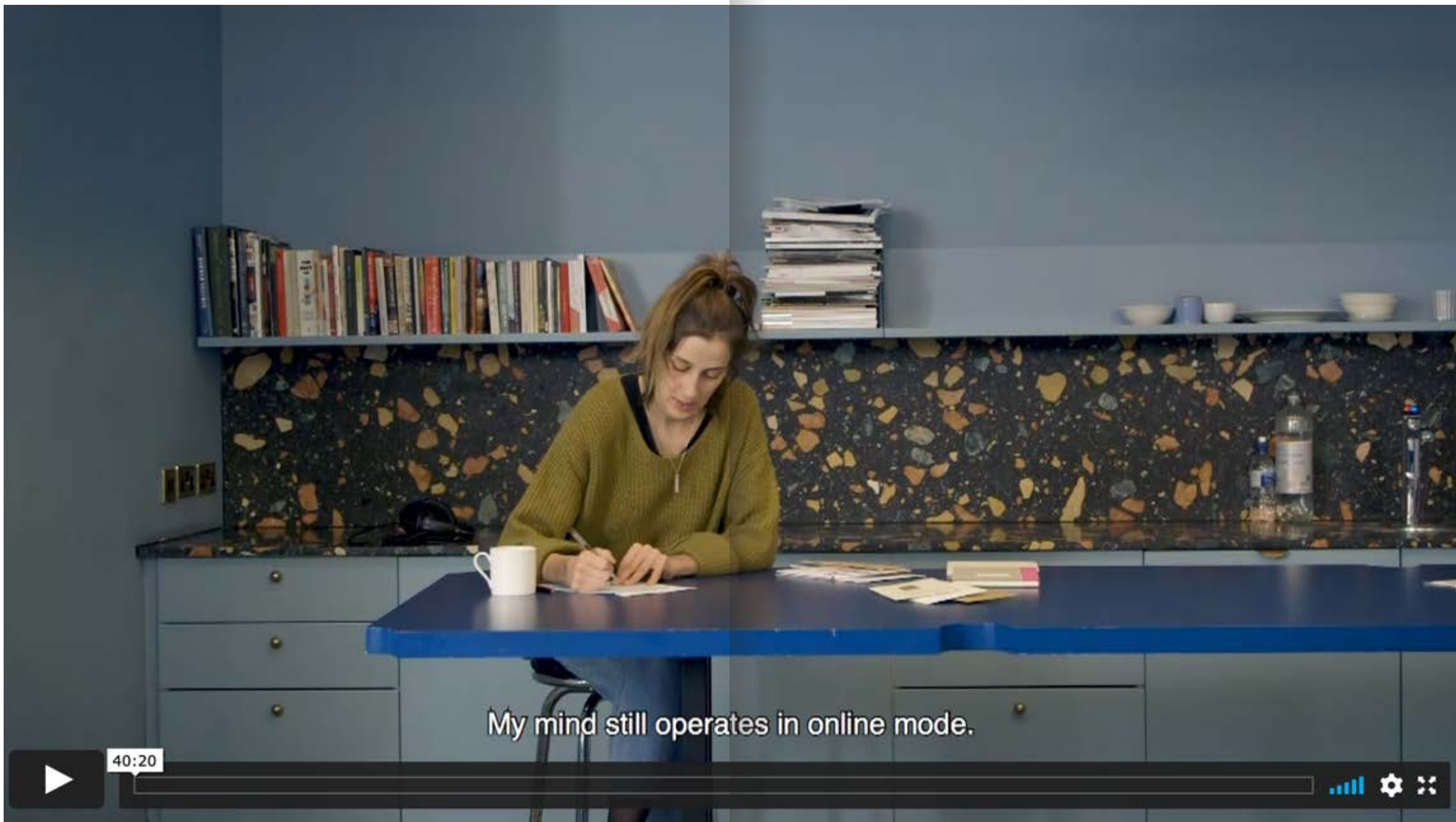My mind still operates in online mode.

Figure 8: Rönkkö, N.S. *6 Months Without*
(2018–2019) (Vimeo screenshot).

platforms of transmission and exchange but may now just as often intervene within and divert the direction of its otherwise pervasive data flows. Networked art practice, in this sense, is an interventionist practice, consciously documenting and exchanging the affects and effects of our globally networked society.

6 Months Without takes its place within a genealogy of conceptual and performance art in which documentation and information provide the work's material base. This tradition includes On Kawara's I Got Up (1968–1979), in which he sent two picture postcards stamped with the time he woke up from his location daily. Tehching Hsieh's One Year Performance series (1978–1986) also explores self-deprivation, variously, of freedom (*Cage Piece*, 1978–1979), personal time (*Time Clock Piece*, 1980–1981), outdoor space (*Outdoor Piece*, 1981–1982) or personal space (*Rope Piece*, 1983–1984, with Linda Montano) or of making art at all (*No Art Piece*, 1985–1986). Rönkkö, like Kawara and Hsieh, explores regimented documentation and communication of daily existence and themes of autonomy and restriction simultaneously. Unlike the well-rehearsed view whereby documentation is understood as undermining the authenticity or liveness of performance, Kawara, Hsieh and Rönkkö's strategy arguably exists to generate documentation as the vital material of the performance.

The main distinction between Kawara and Hsieh's systems of documentation and Rönkkö's in 6 Months Without is that Kawara and Hsieh developed systems prior to online algorithms and GPS, but Rönkkö investigates these experiences in an online world of default self-surveillance. As with Kawara and Hsieh's exhibitions too, stepping away from the pervasiveness of online experience produces physical proof that is progressively reified and fetishized. In Rönkkö's case, the archives of unique handwritten letters she relied upon to communicate across the offline/online, private/social divide come to stand both in place and as the work (Figure 7 and Figure 8).

The experience of being offline for a day invites further speculation on how it would feel to be offline for longer. How long could you be offline? What would it be like to be offline for six months? When we talked with Nastja about this work, one of the things that came up was, of course, the conditions of the global health pandemic caused by COVID-19 and resulting 'lockdowns'. Many of us have spent much more time online in 2020 than we might have otherwise. And therefore, our desire to be offline might have increased. Since then, people have written to Nastja to ask her whether she felt better prepared for the pandemic because of her experience making *the* project. So, the work develops a strange resonance and increased relevance over time where her idea of its performance stopped at the end of that six months, but other people's interest in the possibility of re-enacting or re-performing the work has continued. Re-enactment as a form of preservation becomes resonant with this work, particularly in our current environment affected by anti-pandemic measures.

CASE STUDY: THE MUSEUM OF ORDURE

The **Museum of Ordure** (2001–onwards) actively resists preservation by *"present[ing] the process of digital decay 'bit rot' exploring cyberspace as a site where language and imagery disintegrates just as in the physical world"* (Whitely, 2011, p. 155). The formation of the Museum was directly informed by the practice of pioneering performance artist Stuart Brisley and primarily his establishment of the **Collection of Ordure** in 2000, inspired by Freud's dream of a Museum of Excrement (Brisley, n.d.). Brisley's work since the 1960s has investigated the physiological embodiment of psychological alienation, derangement and trauma. Living and working through the post-WWII and cold war periods, Brisley explored the construction and estrangement of the subject in the context of the material and ideological conditions of East-West European power relations, through durational performances. In 1972 he made the work *And for today… nothing* in which he immersed himself in a bath of black water for two hours a day for two weeks, surrounded by rotting offal. A year later, in 1973–74, during his DAAD residency in West Berlin, Brisley crossed the wall and visited Poland, later loosely chronicled in his short novel *Beyond Reason: Ordure* (2003). In this novel, he introduces the heteronym Rosse Yael Sirb as the curator of the **Collection of Ordure**.

The stated mission of the Museum is *"to examine 'the cultural value of ordure, shit, rubbish' and the waste of human resources through various ownership, production, and management regimes"* (Museum of Ordure, n.d.). A museum dedicated to shit, to the excremental product of capitalist overproduction and consumption and its cultural, environmental and political implications and impact more broadly. A reliquary of something which, since the late eighteenth century, has been anathema to sensibility, something undesirable to be expunged, never to return. The efficient management and disappearance of which becomes a hallmark of public hygiene in maintaining health, efficiency, and taste, and hence, by extension, a society's civilizing influence in comparison to *"primitive cultures that had failed to differentiate muck from what mattered"* (Moore, 2018). Shit is undoubtedly essential, however, whether as bodily or social excrement. It is also inescapable, we realise, in the context of the climate emergency, with digital oversaturation and overconsumption, bullshit jobs and human-induced ecosystem collapse, when *"it is easier to imagine an end to the world than an end to capitalism"* (Fisher, 2009). In elevating something as apparently transient but wholly imminent as ordure as a deserving subject of museumification, the **Museum of Ordure** critiques assumed cultural value otherwise and elsewhere.

The earliest snapshot capture of "www.ordure.org" by the **Wayback Machine** web crawler took place at 01:22:00 on 24 January 2001. It comprises of links to an introduction, "OrdureAbfall" by the curator Rosse Yael Sirb; two texts concerning Sirb by Brisley, one a biography and the other entitled "The Viable World of Rosse Yael Sirb" that later featured

Image::copy

Adrian Ward (adrian@ordure.org)

You may choose any 32x32 portion of one of the images below. You must provide a valid email address, to which you will be sent that portion of the image, and it will be blacked out in this copy. As more people take away their portions, the less of the original will exist here.
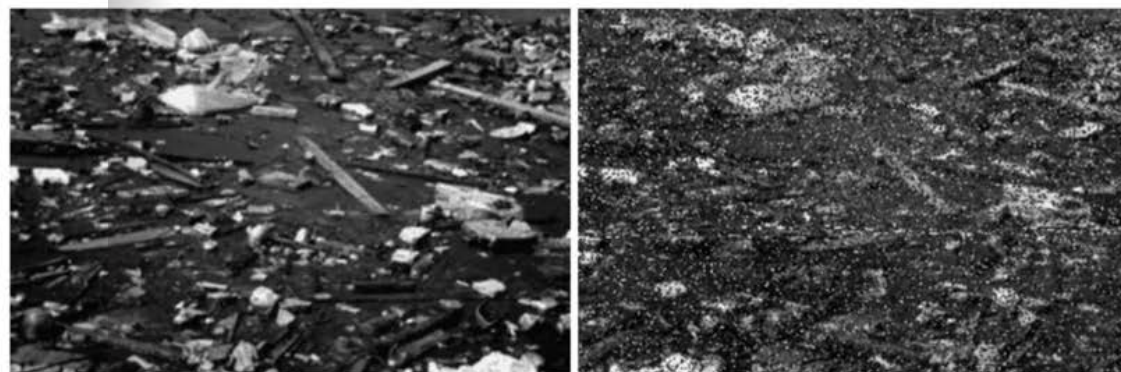
There are three images to choose from, please choose which image you want a piece of, type your email address, and then click on which part of the image you want.

Your email address: [   ]

Figure 9: Ward, A. (2001). *Image::copy*. [Screenshot]. Retrieved from www.ordure.org.

Figure 10: Ward, A. (2001). *Dust*. [Screenshot]. Retrieved from www.ordure.org.

dust

Given time, any digital storage medium loses its data. Corruption sets in as [bit-rot](#) spreads. The image on the left is the original, the image on the right slowly turns to dust.

The decay is triggered by viewing the image. The more people that view the image, the more prevalent its decay.

Adrian Ward

Ordure::real-time is a huge projection. It responds to the presence of visitors moving pixels from one location to another. When the person leaves the image rewrites itself back to its original state. It was exhibited as part of the touring exhibition *Generator* (2002-03), at Spacex, First Site, and Liverpool Biennial, and initially at 291 Gallery, London (2001 – see below).
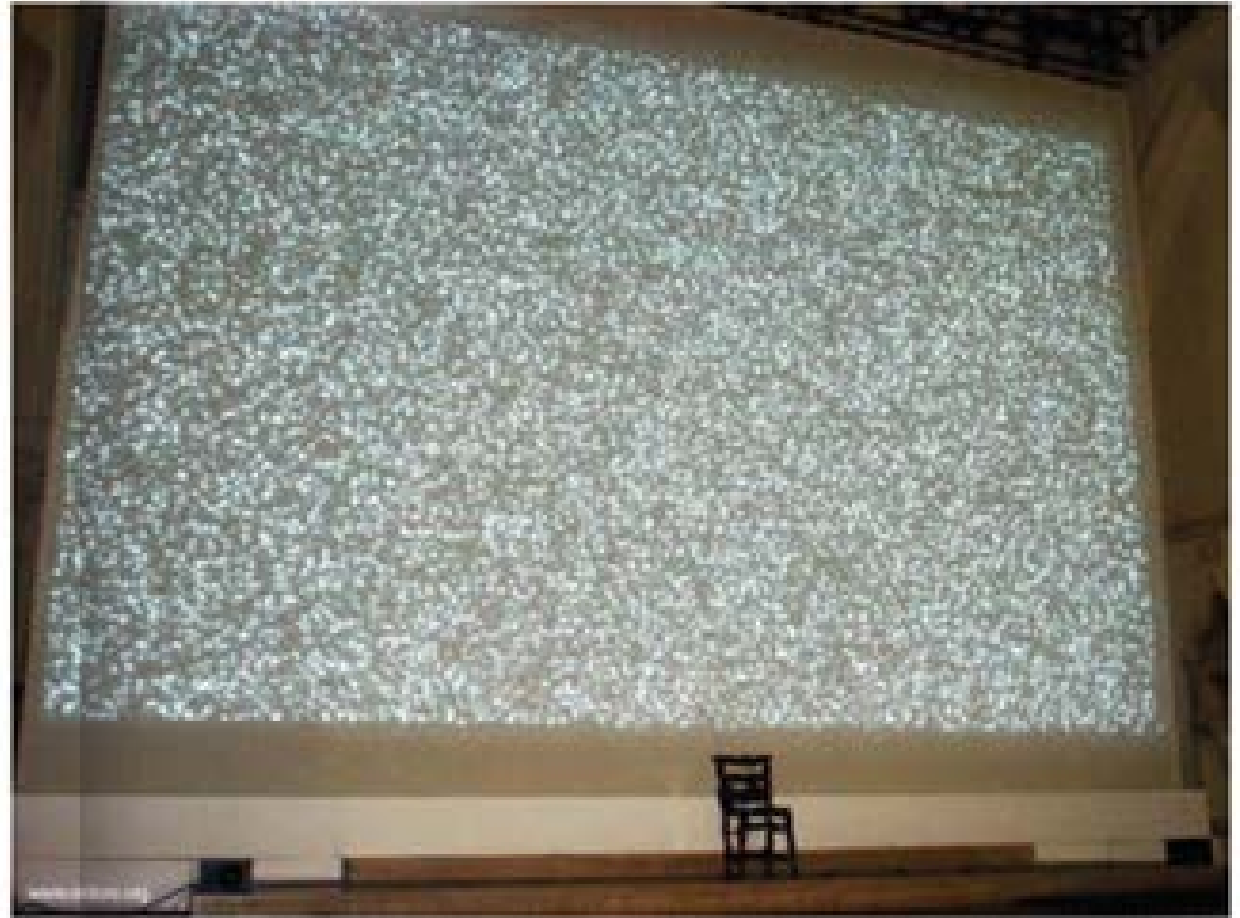
in *Beyond Reason: Ordure* (2003); a file directory titled by its subdomain "dump.ordure.org," comprising at that time correspondence, emails, links, logfiles; and two works by software artist Adrian Ward. **The first is Image::Copy** (2001) (Figure 9) through which the visitor selects, by clicking, any 32x32 portion of an available image, which they would later receive by email upon entering an address, leaving only a black square void in its place.

The second, **Dust** (2001) (Figure 10) similarly explores deterioration but this time as decay rather than removal by presenting a duplicated image side-by-side, purporting one to be the original, while the other slowly turns to dust incrementally in relation to the number of times it is viewed. Further works and projects by the Museum would appear over time extending beyond the online, digital space into offline performances, events and interactive installations. The aesthetic, conceptual and material principles behind **Dust**, for example, became **Ordure::real-time**, described at the **Museum of Ordure** website (Figure 11) as a large-scale projection of the same image which responds to the presence of visitors moving pixels from one location to another, and then noumenonologically "rewrites itself back to its original state" once the visitor leaves. More projects and events followed in a range of galleries and festivals, as did donations to the collection through its iteration as the UK Museum of Ordure (UKMO) hosted at the domain "www.museum-ordure.org.uk."

The **Museum of Ordure** is also notable as an artwork comprising a **Preservation Policy** (2004). The policy outlines its approach and consequence of preserving ordure more than declaring an intention of how it should itself be kept. The principles underpinning this policy, however, are relevant to understanding, as von Hantelmann suggests elsewhere regarding *"the experiential turn"*, how the work *"situate[s] its viewers', the values, conventions, ideologies, and meanings inscribed into this situation which leads to a shift from what the work "says" to what it "does"* (von Hantelmann, 2014). The Preservation Policy is therefore worth reading in full:

> *"Everything that is represented in the **Museum of Ordure** is subject to the vagaries of an uncontrolled internal process which slowly deforms and disables all information held in the museum. This is comparable to the decaying processes which affect all artifacts in museums, regardless of all attempts at preservation: the retouching, repainting, cleaning, etc, which are incorporated risks to the purity of artifacts when first acquired by museums. Even 'successful' renovations are subject to periodic changes resulting from shifts in conservation policies. Eventually (and in accordance with the fallibility of memory) artifacts are institutionally, progressively, determinedly and inadvertently altered by acts of conservation (sometimes unintentional acts of institutional vandalism) until they cease to be recognisable as the objects first acquired. Of course in both cases – in the virtual environment and in the material world – the processes of generation, decay, and entropy are paramount. Museums are by this definition charged with achieving the impossible."* (Preservation Policy, 2004)

In pointing to the impossibility of preservation, the **Museum of Ordure** sets out the scale of challenge of preserving works which sit in-between the virtual environment and the material world, or in this case, in cyberspace, *"as a site where language and imagery disintegrates just as in the physical world"* (Whitely, 2011, p. 155).

DISCUSSION: THE CHALLENGES OF PRESERVING 6 MONTHS WITHOUT AND THE MUSEUM OF ORDURE

Geoff Cox and Nastja Säde Rönkkö agreed to the **Museum of Ordure** and **6 Months Without** becoming case studies for our research. They joined our ISEA 2020 workshop (Hunter & Cook, 2020) to share first-hand insights with participants to develop novel approaches to preservation issues and concerns. Annet Dekker and Anisa Hawes also made opening presentations to frame critical questions and developments in the field. Researchers Bilyana Palankasova, Lozana Rossenova and Erin Walter played an important role in blogging about the workshop exchanges, posted on our archive site, www.networkedart.blog (and contributed to this chapter). With a further twelve artists, curators and conservators participating, the five-hour online workshop was a networked event in itself, taking place across seven time zones from São Paulo to Melbourne. Preliminary questions dealt with defining the boundary around the work to establish the relationship between the *what-is-to-be-preserved* and *the how-to-be-preserved*. For example, invited researcher and web archivist Anisa Hawes asked Geoff Cox whether we should consider recapturing www.ordure.org in whole or in part.

Discussion about what-is-to-be-preserved of the **Museum of Ordure** focused initially on the 110 blank pages in *The Collection* section of the website (http://www.ordure.org/collection/), which, although blank, might be necessary to archive to ensure an accurate representation of the website in its entirety as it appeared at the moment of capture. Geoff responded, describing it as "complex negotiation" as pages were unintentionally blank. Therefore, the decision of what and how to preserve would involve many agencies, echoing Annet Dekker's concept of a network of care. Seeking cues on how to preserve the **Museum of Ordure**, if at all, curator Judit Bodor, wanted to know about the "conception and development of the Museum" regarding "(co)authorship, control over its development and the role of the curator and administrators including Geoff (as a 'node')". Our research blogger, Bilyana Palankasova, asked how Geoff's view of "forgetting as an important component of memory" was incorporated into the Museum's preservation strategy while the project was still active, in anticipation of "the waste and API issues caused by the decaying infrastructure of the website itself". Geoff suggested that such detailed consideration might take the website too seriously, however, given that it has merely fallen into dormancy. He suggested the question may be more significant to a museum conservator or researcher of net art than the artists themselves who've allowed it to fall into disrepair, potentially inverting the idea that the artist's intent is central to decisions around the preservation of the work.

Geoff expressed that the arbitrary choices of material captured by the automated crawlers of the Internet Archive **Wayback Machine** may have

more relevance to the nature of the project. Navigating Adrian Ward's image decomposition pieces through archived pages on the Internet Archive **Wayback Machine** back and forward through time seems an apposite and empathetic form of historical engagement with the work. Doing so might also help address the issue raised by another participant, Gina Cortopassi, of translating "the conceptual dimension of a work" to its archive even when an "experience of deprivation or corruption". The experience of accessing past and present iterations of ordure.org, travelling through the archived time-based future of an image's decomposition, might be even more relevant to the work than a viewer's recollection of experiencing those contingent and fragmentary pages through the live web alone. More so still when now navigating ordure.org, dump.ordure.org and museum-ordure.org on the live web and through its archive across different browser tabs. Conservator Lisa Mansfield questioned, however, the authenticity of an instantiation as captured through the Internet Archive Wayback Machine created from "hybrids of different snapshot fragments not all from the same time". Capturing a situated viewing of the historical site through Webrecorder or Conifer would have addressed that better should the technology have been available at the time. Yet again, achieving an authentic instantiation of "www.ordure.org" would be at odds with the **Museum of Ordure**'s Preservation Policy, which discloses the actuality of its impossibility and maintain a critical stance and distance toward the construction of history itself.

The discussion of **6 Months Without** opened with a consideration of the boundaries of the work of art. The group agreed that a start date may be indicated by the artist first conceiving the performance and expanding to activities such as research, notes, conversations, discussions and even funding applications. However, establishing the end date was more challenging and led to questioning whether participatory works could ever have a definitive end date, if engagement with the work continues. On the question of what-is-to-be-preserved regarding **6 Months Without**, archivist Annet Dekker asked whether we should also conserve the presence of Rönkkö's films on YouTube in addition to the video itself. Is there an irony in streaming video work made from being offline on probably the world's most popular online streaming platform? This consideration speaks to the expanded nature of performance and its edges and boundaries in relation to engagement by audience, researchers, exhibition, activism, or possible restaging of the work. Discussions around participatory action in **6 Months Without**, such as seminars and workshops, expanded the concept of networks within the work and provided further insight. Rönkkö and Sarah Cook, as a curator of the Somerset House **24/7** exhibition, discussed the work's inclusion in the show as a performance, thus shifting the boundaries of the work from performance to exhibition. What is more, this shift also included the exhibition evaluation, reviews, audience images and interaction with the work. This brought about questions about performance interaction and exhibition interaction and their respective engagement, through exchange of physical letters or

social media documentation of exhibition presence. In that sense, the discussion of **6 Months Without** led to thoughtful observations and further problematised the tension between a performance piece, which interrogates living offline, having created digital records, such as videos, automated emails and other web residue. In that sense, the discussions about what-is-to-be-preserved focused on defining the boundaries of the work and considered its migration from the analogue to the digital. In a parallel manner, in shifting the boundaries of the work from performance to exhibition, the discussion considered exhibition as a tactic of restoration and preservation in the canon of history of art. Restaging a work or selecting it for an exhibition often increases its value and repositions it historically. What is more, a conservator acting as a producer and a manager over the lifespan of a work frames their work as discursive and positions them as an active caretaker within the network of care.

In considering **6 Months Without** alongside the **Museum of Ordure**, the conversation focused on the role of forgetting as an essential part of memory and the ways in which the omittance, decay or resistance to documentation influences the value of the work. Both case study artworks were realised in a wide network of actants, agents and conditions, both human and non-human, on and offline. These expanded webs of interaction, constituting a huge aspect of the networked nature of the works, were also considered as part of a potential network of care, following Annet Dekker. A dispersed and decentralised network of preservation, however, would have implications over the ownership of the work in question. The discussion reflected on how qualities such as fragmentation and obsolescence were present in the preservation of performance or net art and how that determines the value of the work.

Keeping up with the discussion about the edges of the work, the conversation considered documenting a performance score. In determining boundaries, the group wondered what information constitutes the score and whether it needs to be recorded for future re-performance, activism or research. More importantly, how does this, as a form of documentation, reflect and communicate the conceptual dimensions of the work and the artist's intention? What pieces of documentation are necessary to capture the artistic context from which the work emerged and will translate that essence in future restaging? Drawing parallels with the **Museum of Ordure**, it is worth highlighting that both artworks like to resist or neglect their dependence on the Internet. If **6 Months Without** generates a huge amount of physical artefacts and is perhaps an unorthodox choice for a case study on networked art practice, its study aptly addresses our increased dependence on networked technologies and offers a valuable consideration of complex artworks, presenting challenges to preservation. Capturing the value of the **Museum of Ordure** and particularly the artists' intent in the work is difficult while planning a preservation strategy which is arguably going to

generate more information. Is it 'meta' to try to preserve a project, which is a commentary on the systems determining value in the first place? There seems to be resistance on the part of both case studies of artworks to cross over to the other side, whether it is conceptually embedded in the work to decay and thus hard to establish its boundary and appropriate preservation. Moreover, it lends to considerations whether preservation questions or challenges the work itself by producing digital artefacts, possibly in conflict with the work's intentions.

PRESERVATION OF NETWORKED ARTWORKS AND PRACTICES… IN THE NETWORK

This chapter has offered a survey of approaches to the conservation of networked artworks and practices without undermining their unruly materiality and criticality of institutional process and spaces. Mindful of jeopardising the underlying principles and dimensions of the practice itself, we sought nonetheless to trace the edges and boundaries of the preservation of networked art practices. Ongoing debates about omissions and distortions in the construction of art histories and their subsequent influence on the production of future art practice add further urgency. Ensuring a reliable understanding of networked art practices during the last sixty years and contributing toward the evolution of preservation methods in response also helps us understand, in media archaeological terms, *"how we ended up in this digital culture and [perhaps] find alternative ways of thinking about [it]."* (Parikka, 2001). Given our conception of materiality has changed since the digital turn, we can only expect that artworks in the future will continue to evolve in further contingent, precarious and hybrid ways.

We identified the problem of networked art practice preservation as distinct from media art challenges of preservation. We highlighted the necessity to focus on the performative processes of social, cultural, and technological exchanges that underpin the work and maintain its interaction with contemporary cultural ecologies.

Networked art practice comprises exchanges that can be revisited, reemployed, reconsidered, and resituated due to their integral relevance to our contemporary social, cultural and political experience. Thus, we see greater promise in the undertaking of media archaeological excavation of processes that underpin these works. Here, we see the possibility of harnessing a source for the generation of new work, that is porous and susceptible to contemporary discourse.

Of further interest is how artistic engagement with the internet and other networks reveals a curatorial dimension already present in networked art practices. While the future of networked art preservation depends on collaboration between artists, curators, conservators, and archivists performing their existing roles, we recognise that networked art practice is itself an outcome of artists already behaving curatorially – seizing the means of dissemination as essential to the production of the work. As such its preservation would thus benefit from collaborations that see curators encouraged to think and behave artistically.

If these are the considerations that those responsible – artists, curators, conservators, and archivists – have to consider, then what about the non-human elements, the artwork and its network? What are the differences for networked art practice before and after digital preservation? Does it depend on whether the artwork was made before or after the Internet, or used non-digital or non-electronic means? Our interest is in digital preservation of networked art rather than digital art's preservation – the work doesn't have to be digital in the first place. As networked art practices predate the web, then what did offline/online mean before the Internet? Digital preservation suggests a move from one (unstable) format to another (more stable or which makes the work accessible). This move could however exist in the work itself – away from the intangible digital to a more physical manifestation, as in **6 Months Without**, or the opposite, in the **Museum of Ordure**, towards the abstraction, digitality, decomposition, and glitch of the digital dump. There are 20 years between the two case study artworks discussed in this chapter. That gap arguably includes the moment when a threshold of society's increasing digital ubiquity was crossed: the point where it became imperative that the internet never be turned off (Fisher, 2009). We note that digital preservation on the industrial scale undertaken by museums, libraries and archives is far from carbon neutral and risks being subject to the same capitalist and environmentally damaging excesses of hoarding and storage as other corners of the art world. This tension, and others raised through this research, indicate where current preservation and conservation processes – enacted by humans or by machines – may risk sealing unsustainable impermeable material and historical boundaries around networked art practice, thus depriving its potential to act in the world and form connections with new nodes in its always-on network.

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ECOSYSTEMS AND ARTISTIC RESEARCH IN FORMING DIGITAL CURATORIAL INFRASTRUCTURES

MICHAL KLODNER

DILEMMAS OF DIGITAL CURATION

Digitization and digitalization have become fundamental means of transformation of memory institutions and their role in the information society. Not only the collections of artworks, literature, and documents, but also majority of social representations have turned to data formats. Digital media and institutional critique have transformed knowledge processes and organizational ecologies. Archives and galleries have become content providers for digital distribution channels. While they became primarily providers of digital content, the indicators according to which their performance is evaluated are quantity of digital content they produce, its reach, and consumer engagement on digital platforms.

Nevertheless, the flip side of this picture has revealed many ongoing and even enlarging gaps and problems calling for critical analysis. At the very heart of these issues are general questions of democracy and equal rights to social representation. The architecture of corporate digital infrastructures limits the discourse and our ability to represent non-majority societies, and more than human actors. Moreover, there are unresolved concerns about environmental and climate issues affecting the sustainability of digital transformation. Facing these circumstances, the humanities and digital curation of media art are in the process of embracing new approaches.

The first stage of the digitalization of cultural heritage and the accompanying discourse within the digital humanities began in the 1990's. Scholars participating in projects of building research repositories and editing metadata were engaged in a wide range of discussions, from technical to philosophical, and they were getting acquainted with markup languages and creating model content types. Within that convergence of humanities and information engineering, the power of rhetorical arguments had been slowly embodied and tamed by information structures. (Drucker, 2012)

At the same time, the digital archiving strategies, influenced by post-structuralism and deconstruction, were reshaped by the urge to reconsider categories of identity, gender, race, nations, authorship, power relations, bodies, and subjectivity. Questions that are part of decision making at the memory institutions, like what and why something is included in and excluded from digital archives and represented in research, turns out to be political, or at least a matter of collection policies.

Despite all of the novel approaches in curation and seemingly unlimited possibilities of displaying the archival material, it is always limited by the underlying information infrastructures, which carry a variety of biases and presumptions. For example, communication channels, data modes, and visual rhetoric are borrowed from areas like commerce and business applications. In the words of Miriam Posner:

> *"We can do what we know how to do: visualize datasets that we inherit from governments, corporations, and cultural institutions, using tools that we have borrowed from corporations. Or we can scrutinize data, rip it apart, rebuild it, reimagine it, and perhaps build something entirely different and weirder and more ambitious."* (Posner, 2016)

Jonathan Gray and his colleagues draw attention to how data infrastructures carry normative forces by producing data formats prioritising certain ways of knowing over others and thus can be also mal-aligned with publics interests. (Gray et al., 2018) They emphasize our need for 'data infrastructure literacy', which provides more than just knowledge of data as a resource of static and finished information to be utilised, but embraces how data infrastructures organize and materialize relations between people, things, disciplines and technologies. The data literacy should not just accessorize people with data processing skills, but its goal is to cultivate sensibilities for data culture and data politics. These new sensitivities include our awareness of whereas infrastructures *"make space for collective inquiry, experimentation, imagination and intervention around data in educational programmes and beyond, including how data infrastructures can be challenged, contested, reshaped and repurposed."* (Gray et al., 2018)

Increasing volumes of digital data and the gradual centralization of information services, which is marketed as the 'cloud', negatively impacts ecosystems and has limited benefits for many organizations. The outsourcing of information technologies to cloud companies was accompanied by unrealistic expectations. Cloud was ideal for speculative investment into 'startups' without their own infrastructure to achieve fast development and quickly assess their market value. The situation of memory institutions like archives and museums is quite different as they are setting their goals in long time periods. Unfortunately, the digitalization of state and public institutions often leads to large-scale repositories with generic features and corporate design. Digital archives could easily fall under the rubric of 'research infrastructures', aimed at providing services for industrial development and competitive economy.

The immateriality of cloud was a carefully crafted illusion. Expanding digital infrastructures and the growing amount of data are not without ecological consequences that the metaphor of cloud obscures. According to the data of IDC (International Data Corporation)[1], there were 500 thousand data centres worldwide in 2012. In 2019 it was already 8 million, which counts for a 16-fold increase. By energy consumption 3% globally, digital media has surpassed the airlines' industry, and the prediction for 2025 is a growth to 5–6% of worldwide energy consumption. The area of server farms goes from an average of 1000 square meters to 12 hectares, with energy consumption up to 100 megawatts. The building of server housing facilities, equipped with cooling systems and power generators, consumes large quantities of construction material even when using renewable energy. Over the course of its lifetime the average smartphone generates 33 times more energy consumption in operations in datacenters than in its own use. The energy mix in the power grids still contains a significant part coming from coal and gas. The underlying infrastructure, as well as transport and parking, severely damages agricultural soil and natural landscapes, producing extraordinary material and energy demands that have never existed before. We should visualise the reality of smoking factories behind our websites and mobile applications.

1   IDC's Worldwide Quarterly Server and Network infrastructure trackers. IDC 2008–2019. Retrieved from https://www.idc.com/prodserv/subservices.jsp

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Does being data protect us from harm?

Phones Could Track the Spread of Covid-19. Is It a Good Idea?

China and South Korea used smartphone apps to monitor people with the disease. But Americans have different views on the track-and-trace data collection.

DATA AS PROTEST
DATA AS ACCOUNTABILITY
DATA AS COLLECTIVE ACTION
DATA AS ABOLITION
DATA AS SELF-DETERMINATION
NO MORE DATA WEAPONS

DATA FOR BLACK LIVES

Privacy
By MORGAN MEAKER
Monday 2 July 2018

Europe is using smartphone data as a weapon to deport refugees

European leaders need to bring immigration numbers down, and metadata on smartphones could be just what they need to start sending migrants back

Does being data potentially kill us?

Does being data show the world who we really are?

why are black women so
why are black women so angry
why are black women so loud
why are black women so mean
why are black women so attractive
why are black women so lazy
why are black women so annoying
why are black women so confident

What does not having data mean? Is it missing? How much harm is being done by not looking at the full picture, but only ever using the perspectives of the ones with power? What would data collected on the margins show?

Missing data, what does it mean? Who would use it if it was there? Can data show intersectionality? Can data help us understand perspectives that are not usually heard? Can data help us to actually do good, not just think we are? Can data help make the world a better place? How much suffering is caused by data and how much by not having it?

Minorities Report - Speculative Subversions   17

Figure 1: Zavala, K. & Odendaal, A. (2020). *Algorithms of Late Capitalism zine #3.* The project reflects socio-cultural critique of tech, surveillance or AI. Retrieved from https://algorithmsoflatecapitalism.tumblr.com/zines

BABYLON OF EXPERTS

When we think of sustainable approaches, some deeper questions about our society arise. Natural resources are depleted by the extractive consumption economy, but there is undeniably a cultural dimension of unsustainability relating to behaviors, social conventions, institutions, values, worldviews, and epistemological bases. (Kagan, 2013, p. 24) In our society, vertical, spiritual, substantive rationality that fostered critical reflection was supplanted by sensoric, hyper-consumerist rationality and technologist effectivity. Historical developments of science has constituted a worldview that is atomistic and individualistic. Things are distinct and measurable material entities, people are separated from each other and from their environment. Industrial and postindustrial western societies are the paradigms of economic progress and development. However, not only philosophers suggest that there might be something wrong with the modernist scientific thought and its application. Erwin Laszlo points out that this atomistic view, inherited from the modern scientific method, has its roots in the fragmentation of our understanding. (Laszlo, 1996, p. 33) An advocate of transdisciplinary thinking, Basarab Nicolescu , refers to it as a 'paradigm of simplicity', and contends that it is based on the binary thinking produced by classical logic and the rigid norms of truth in science, thanks to which *"discipline can pretend to contain all knowledge within its own field entirely"*. (Nicolescu, 2002, p. 33)

During the pandemic of Covid-19 disease we could observe how the impervious boundaries of specializations limited any expert discussion. Journalists were often met with evasive answers from experts like: "I am a clinician, you have to ask epidemiologist", "I am an epidemiologist, you have to ask immunologist", "I am an immunologist you have to ask vaccinologist" and so on. Even the scholars of environmental subdisciplines, that just operate on varied scales, e.g., population biology and ecosystem ecology, were often not able to communicate with each other. (Kuneš, 2020, p. 215)

Nicolescu describes this situation of narrow specialization of human knowledge as Babelisation:

"The decision-maker becomes increasingly more incompetent regardless of his or her intention [...] even a group comprised of the best specialists from all the various disciplines would only be able to develop a generalized incompetence, for the simple reason that the sum total of competencies is not competence: on technical level, the intersection between different domains of knowledge is an empty ensemble." (Nicolescu, 2002, p. 42)

He also sees the technology as a main driver force of the atomization of science and claims that the awaited benefits of specializations of disciplines turned to opposite consequences: *"a multischizoid, complex reality has replaced what should have been the simple one-dimensional reality of classical thought"*. (Nicolescu, 2002, p. 37)

Despite all the scientific discoveries and knowledge, we've seen the growth of anti-scientific worldview. The number of Flat Earthers, rejecting any fact or rational argument, the Q-anon and other conspiracy theories that accumulated followers by offering easy answers to complex problems. What science cannot explain is replaced by magical thinking and slippery logic that home on affective concerns and behaviors. Q-anon snowballed this way other social groups, being interested in holistic thinking, yoga, or wellness. Undermoderated social platforms provided by global corporations just took advantage of situation they created themselves, and amplify affect and fear to monetize on, while slipping out of any social responsibility.

We should learn from this situation on social media while searching for transdisciplinary solutions for science suffering from 'Babelisation' and to work for a more consistent, socially interconnected communication networks set up to ensure that exclusive specialized knowledge has to be followed by additional levels of inclusive public discourse. The same goal is necessary when the interfaces of public cultural repositories are designed.

In *Art and Sustainability*, Sacha Kagan (Kagan, 2013, p. 37) describes how 'Technological System', e.g., efficient and rational implementation of technology and technocratic decisions throughout the whole society, is deeply rooted in positivism of Enlightenment accepts only one common logic that is based on representation by numbers, while anything escaping this reasoning is seen as a mere illusion. The pure reason of positivists science is driving the technical progress, and thus it is required to be free of any mythical thought and to become an universal instrument in all-encompassing economical apparatus. Universal robots in Karel Čapek's dystopic play *R. U. R.*, *Rossum's Universal Robots* (1921) illustrated this idea by being designed to produce anything 'ad infinitum', without rising any ethical or moral questions. Niklas Luhman, system sociologist, remarks:

"Technological progress leads to ecological disasters, which cannot be avoided however only through more advance technological progress and thus at the price of an even greater dependency of society to technology." (Luhmann, 1999, p. 47)

On the contrary, Kagan explains, the art does not fit into this system of the 'most efficient method' and artists as dreamers are part of quite opposite invention of 19th century – subjectivity and individualism of Romanticism. 'Romantic Order' is where all intuition, imagination, attention to feelings and admiration of nature reside. Artists in Romantic Order are gifted to

create works of exceptional beauty by their hands, they are independent and free from influences from the others. This dichotomy, as a result, creates an artist, isolated outside of the Technological System, locked in their romantic realm of individual genius as in an escapist ghetto, and freed from the structural hold of formal rationality. (Kagan, 2013, p. 70) In the 20th century, a number of art movements addressed the difficulties of this profound division of the social from the technological, and artists refused to remain silent in the face of technocratic authority in their purported capacity as producers of aesthetic objects.

Before going into greater detail about how systems art and media art contribute to interdisciplinary dialogues between science, technology, and society, it is important to note how artistic research, in general, underlies inventive data practices and how it can question the default lines of inquiry that are built into data infrastructures, including reassembling them in accordance with public interests.

Artistic research is grounded in practice led research as a distinctive feature of the research activities conducted by arts and humanities researchers. It involves the identification of research questions, contexts and problems, while the research methods and outputs incorporate a significant focus on creative practice. At that interdisciplinarity in artistic research involves not only multiple disciplines (informatics, biology, …), but also multiple base domains of inquiry. Graeme Sullivan (Sullivan, 2009) defines those domains as

Interpretivist: constructivist creation of meaning, network, dialogue, interdiscipline
Empiricist: exploratory, conceptual, reflective, discipline-based
Critical: positionality-change, contextual, perspective, question, transdiscipline

Art practice is meta-theoretical, practical, reflexive, post-discipline and makes use of visual systems accordingly. It also comes in coupled with abovementioned interpretivist, empiricist and critical domains forming theory dimensions: Meaning-making, Enact-explain, Create-critique.

ENTANGLEMENT OF VIDEO ART AND SYSTEMS ART

In the September issue of Artforum in 1968, Jack Burnham published an article Systemic Aesthetics, where he wrote :

"Increasingly, products – either in art or life – become irrelevant and different set of needs arise: these revolve around such concerns as maintaining the biological livability of the earth, producing more accurate models of social interaction, understanding the growing symbiosis in man-machine relations, establishing priorities for the usage and conservation of natural resources, and defining alternative patterns of education, productivity and leisure." (Burnham, 1968, p. 30)

Burnham, art theorist, critic and curator, who established the field of systems art, continued:

"In the emergent 'superscientific culture' long-range decision making and its implementation become more difficult and more necessary. [...] A systems viewpoint is focused on the creation of stable, on-going relationships between organic and non-organic systems be these neighborhoods, industrial complexes, farms, transportation systems, information centers, recreation centers, or any of the other matrixes of human activity." (Burnham, 1968, p. 30)

The editorial of the first issue of Radical Software in 1970, pointed to an obsession with hardware, be it in the form of land, labor, or capital, in contrary to software as an access to information and its dissemination. In the argument, the 'techno-sphere' and cybernetics were placed on the same level as natural and organic systems, and the software was introduced as a realm of the real power, and thus as a place where the battle must be fought over information structures:

"Unless we design and build alternative information structures that go beyond and reconfigure existing ones, then alternative systems and lifestyles will be nothing more than products of the existing process." (Radical Software, 1970, p. 1)

It is significant that the magazine dedicated to independent video practices, had three equal sections, Hardware, Software, and Environment, which differs its approach to the issues connected with media from McLuhan's technological determinism.

In a similar vein Michael Shamberg, author of **Guerilla Television**, (Shamberg, 1971) the major Radical Software publication, describes the word radical not in the sense of political revolution and physical disruption of the system, but as a post-political discontinuity with the past,

the transition from the old consciousness to the new consciousness through open information tools. He suggests to replace corporate broadcast TV influence on American mind at the time by using low-cost video-tape cameras, video cassettes, and cable television and designing alternative television networks that favor portability and decentralization.

There were key Raindance Corporation members among the contributors of the magazine – Frank Gillette and Paul Ryan, as well as Gene Youngblood, Nam June Paik and Buckminster Fuller. The Radical Software as a communication platform developed the idea of media ecology as the study of communication media and their effect on other media and society. It played a crucial conceptual role in this regard. In conjunction with the then new cheap video technology, artists and activist groups formed local loops of community media. In opposition to the central control of one-way broadcasting of mainstream media, collectives such as Ant Farm, Videofreex, The Kitchen and dozens of others experimented with possibilities of the social integration of video and cybernetic systems and in doing so they have built grassroot systems of self-representation. The same pattern applies to the feminist video movement, of which we may mention Martha Rosler and her **Vital Statistics of a Citizen**, simply obtained (1977), marking the era when feminist and women collectives were using the video camera to interrogate the politics of representation in maintaining hegemonic power structures. Martha Rosler poses as an object to be 'objectively' measured and represented by data from the outside, by male-dominated science. Feminist video art practices from the 1970s and 1980s play an important role in reconfiguring norms and social conventions in cultural systems. (Long, 2016, p. 19)

In addition to the explicitly political urban New Left of the 1970's, there was also the New Communality movement, which tended to return to the countryside and to a model of transformative revolution focused on interpersonal relationships and consciousness. On the remark of media and ecology, Gyorgy Kepes, the founder of the Center for Advanced Visual Studies at the Massachusetts Institute of Technology in Boston, USA, in the Arts of the Environment (1972), wrote:

> *"Environmental homeostasis at the global level is now necessary for survival. Creative imagination and artistic sensitivity can be seen as one of our basic, collective, self-regulating devices that help us all register and reject what is toxic and find what is useful and meaningful."* (Kepes, 1972, p. 6)

Regarding examples, the Ant Farm collective, in addition to their media performances, researched alternative architecture practices and environmental design. Pulsa Group, an interdisciplinary collective, dealing with the differences between sociotechnological and biopolitical systems, also contributed to emergence of systems art. Its members, who referred to themselves as 'Researchers in programmed environments', proposed to correct systemic breakdowns by imaginatively expanding the interactive

awareness of local media populations, which include feedback principles: environments, program events, cable television, tapes, and movies. In one of their projects – **Harmony Ranch** (1966–1973) – they experimented with self-organized collective organic farming to find out about long-term growth rhythms and regenerative changes. Agriculture and the dynamics of group life were part of their ecology of cybernetic systems, whether focused on soil quality and vegetable production, or cooperative social forms and music production with acoustic and computerized instruments. (O'Brien, 2016) Their connection with the media art scene of the time was maintained by visits of Nam June Paik, Karlheinz Stockhausen or Steve Reich.

We can draw the conclusion that since the emergence of media art, media ecology is both a condition and accompanying phenomenon of the natural ecology. Electronic media arts as socio-cybernetic systems were created with intrinsic sensitivity to environmental sustainability in their very heart. We have also seen that software was at the center of attention. It was not only the computer software as we know it today, but software understood as a discourse and the whole body of social practice.

CURATING ECOSYSTEMS

In 1990's, new media as emerging 'digital utopia' fit well into the narrative of innovation, where specialized knowledge is generated through experimentation, which can be applied in the industrial society. The curatorial policy of the new media was suitable for art centers, subsidized by technology companies. The specialization in recognizable industrial domains went well along with the government's policies of funding art laboratories under the roof of centers of excellence. However, nowadays we see a growing shift towards critical approaches.

In a significant text on the curation of new media, Steve Dietz identified more than twenty labels being used as equivalents to new media, including computer art, electronic art, multimedia, digital art, software art, cybernetic art, next media, or variable media. (Dietz, 2000) He noted that new media after 2000 lost the charge of novelty and curators, instead of exhibiting the most technologically advanced media, began to work also with artists using obsolete media, low-tech and DIY tactics. The term new media was replaced with the term media art, that subtly marks the shift from high-tech art, with a starting point in technological progress, to contextually aware and critical exploration of digital and networked media. Many of the media art projects articulating the systemic and ecological ways of thinking and aesthetic preferences that Jack Burnham elaborated in his essay or which subsequently emerged, are of renewed interest to art critics and curators today while media art seems to be able to embrace a theory of systems along with ecosystem research. Ecologically charged and systemic aesthetics embodying art provide arguments as to why it is necessary to consider the wider context when discussing media art conservation. It shifts our thinking from artworks as visual artefacts, like

moving images, towards artworks as open cybernetic systems, involving social actors or living ecosystems.

We can compare one of the original works of Hans Haacke with a contemporary example to underline analogies between the systems art of 1970s and the present. Hans Haacke's **Rhine-Water Purification Plant (1972)** at the Krefeld Museum, included a device for purifying water from the Rhine with functional chemical treatment and water filtration using activated carbon and sand. The purified water was pumped into a large transparent acrylic tank with swimming goldfish to demonstrate how it is possible to construct a life-supporting system technologically. However, the project also intervened behind the cosmetic patch of restorative eco-aesthetics. Haacke documented the extent of the pollution of the wastewater discharged into the Rhine in Krefeld, which amounted to 42 million cubic meters each year, and quantified the volume and types of industrial and domestic waste, listing the main polluters. The project addressed the need to restore the degraded ecosystem and pointed out the city's role in pollution, which attracted attention from the local media He called the political effect of this work *"a real-time social system"*. (Demos, 2016, p. 47)

Figure 2: Brain, T. (2011, 2021). *Coin-Operated Wetland*. Retrieved from http://tegabrain.com/Coin-Operated-Wetland. Recreates natural water purification circuit in a gallery. Image by Alex Davies.

Among Tega Brain's earliest artworks, based in environmental engineering and examination of issues of ecology, data systems and infrastructure is **Coin-Operated Wetland** (2011, 2021). A people operated laundromat with closed water circuit built in a gallery consists of a soil and plant purification system for wastewater to return clean water back to washing machine.

"We could only do one load per day because that's the pace at which the plants could consume the water. But if we're going to shift away from seeing ecosystems strictly as service providers and towards a more negotiated, reciprocal relationship with them, our systems are going to need a little more give." (Brain, 2019)

Preservation and conservation projects should not be limited to technological structures and formal features of the artwork. At the symposium **Contemporary Art Conservation Revisited: 20 years later**, held in 2022 at the Bern Academy of the Arts (Haidvogl et al., 2022), Coline Ardouin presented paper on the topic of managing and caring for living plants that are part of an art installation in a museum setting, which requires cooperation with experts from different fields, such as biology or botany. Example of such curatorial practice can be the **Beuys' Acorns** (2007–2025). Re-enacting project of Heather Ackroyd and Dan Harvey involved trees grown from acorns collected from Joseph Beuys' **7000 Oaks** (7000 Eichen, 1982–1986) social sculpture. In this landmark artwork, by putting oak trees and other tree species in public locations, Beuys hoped to transform Kassel from the "city of administration" to the "city of trees". A basalt column was to be buried in the earth adjacent to each tree. Organizationally and financially ambitious project was launched in 1982 as part of the Documenta 7 exhibition by transporting all the columns to the park, where they were assembled into an enormous sculpture. The basalt mass and consequent planting was met with disfavors and obstacles. Planting carried on by number of people and groups for several years, until finally the material sculpture disappeared, turning into the invisible 'social sculpture'. While Beuys' artistic vision was to transform consciousness so that the biosphere, as a healthy, biological and essential atmosphere, would be consistent with human and multi-species needs, the reiteration of this ecological project, The **Beuys' Acorns** took form of a tour with discussions of these topics through French cities in advance of the United Nations Conference on Climate Change in Paris in 2016, and continued through various institutions across United Kingdom. The saplings have acted as both artwork and catalyst for a public discussion on climate change carried out in galleries and exhibitions. In 2021, artists Ackroyd & Harvey have installed **Beuys' Acorns**, a group of 100 oak trees, on Tate Modern's South Terrace. The trees were exhibited at Tate Modern in London and as part of Beuys' legacy, seven of the oak saplings were permanently planted in the local area. The artists aim to plant the remaining trees by 2025. (Tate Modern, 2021)

ART OF DIGITAL COMMUNITIES AND OPEN PUBLIC INFRASTRUCTURES

In 2010, in a lecture Freedom in the Cloud, held for the Internet Society New York, Eben Moglen recapitulated the development of networks, from the original ideas of all peers on the same level, changing gradually to omnipotent servers in the cloud and surveilled 'users' under the secretive economy of data mining. He called it the architecture of disaster. An increasing concentration of power has emerged without any discussion of the long-term social consequences. The asymmetry between thin clients against strengthening servers also means the increasing impotency of people who own the client devices. Only the music that the monopoly music publisher permits can be played on a phone. It's not what one wants to listen to, but what is in the majority economic interest of the publishers to be listened to. It is no longer the case of software companies, but management of platform business models. (Moglen, 2010) The lecture happened to be the starting point leading to the development of public social networks, critique of using the word 'user' for humans and Moglen's idea of small internet device, a personal mobile server, having all the apps to facilitate the communication among people, called Freedom Box, became a reality ten years later.

Moglen's lecture inspired four students of New York University to start a crowdfunding campaign. At the end of 2010, they released the first version of diaspora*, which was to replace Facebook with a decentralized network, sponsored by a public institution and not owned by anyone. Diaspora was a media sensation before a line of code was written. The youth, inexperience, high expectations, and bugs of the first version left an indelible mark on the project and later would sink further huge difficulties. As a 'startup', it failed, but the community prevailed and today it is second largest open social network.

In decentralized social networks, there is no one central website. There is many of them, with different names, with different individual or organizational providers. These nodes create a connected network by using a common protocol, based on standardized message types, understandable to all nodes. If it sounds faintly familiar, that's exactly how internet was designed to work.

Based on the StatusNet software and the OStatus protocol, **identi.ca** (2008-) was maybe the first node of the independent social network. It was mostly concerned with the free software community. As an extension of the RSS/Atom web publishing protocol, which is still widely used for podcasts, Evan Podromou standardized Ostatus in 2010. With a reader app for RSS or a podcast, anyone can collect interesting news from various internet places by subscribing without needing to visit each site again and again. However, RSS does not allow for comments, sharing, or interaction, which is why events and their actors were included as an extension. Evan Podromou continued his work on various social projects

and is a co-author of ActivityStreams,[2] a major open format specification for activity protocols, which are used to syndicate activities taken in social web applications and services, already widely used by websites, and decentralized social media hubs, creating a network known as the Fediverse. (Monoskop, 2022)

By the time Diaspora∗ was in its infancy, Mike MacGirvin wrote the DFRN (Distributed Friends and Relations Network) protocol. Connections to Status.Net via their OStatus protocol, as well as Twitter and Facebook, were functional. He later studied the source code and packets of Diaspora∗, and thanks to Ilya Zhitomyrsky, succeeded in creating a functional federation module for the Diaspora. Mike MacGirvin has been dealing with decentralized protocols for decades. In the 1980s, he wrote federated software for bulletin boards that provided several services, file downloads, email, games, and news. It was able to send federated messages to FidoNet, Bitnet and ARPAnet. Farming in rural Australia, Mike manages the development of projects for decentralized social networks. He has abandoned all project branding and roadmaps in favor of developing an ethical solution for harmful online communities. When not battling wildfires, he goes to feed his horses, listens to what they have to say, and then addresses the concerns of the online community in the support forum.

The power and money dominated culture of 'tech-bros' of Silicon Valley is rejected also by feminist and cyberfeminist collectives. **The systerserver** (2005–) is a physically situated server run by women to be their own space and medium of expression. They intentionally avoid proclaimed 'ease-of-use' of commercial services for the similar reasons as (Drucker, 2012) and (Posner, 2016) in digital humanities. Communities of techno-feminist practice are informed by Donna Haraway's 'situated knowledges'. (Haraway, 1988) The idea concerns how concrete practices of particular people virtually make truth. Cyberfeminists from KRYSS Network explain how to understand the notion of feminist server:

> *"An informal group of feminists have been imagining a more autonomous infrastructure that puts human well-being at the core of technology and governance, to ensure that the data, work and memory of feminists are better accessible, preserved, managed and controlled in ways that allow for the promotion of human rights and the exercise of online freedoms of opinion and expression, and of assembly and of association, of rights to information and privacy, and of how the concept of consent is clearly defined."* (Lim, Serene & Kuga Thas, M. Angela, 2021)

5   ActivityStreams 2.0 W3C Reccomendation (2017). Retrieved from https://www.w3.org/TR/activitystreams-core/

Figure 4: Varia collective. (2016-). *Bibliotecha Varia*. Retrieved from https://network-sofonesown.varia.zone/Bibliotecha/. In Rotterdam, artists, media students and theorists formed around the Varia space placed an unusual electronic book into their bookshelve. Bibliotecha proposes an alternative model of distribution for digital texts. It allows specific communities to form and share their collections, through a single-board computer running free software to share books over a local WIFI hotspot. No server farm required. Source: varia.zone

In response to the dystopia of global corporate surveillance megastructure and geopolitical architecture, which Benjamin Bratton entitled The Stack (Bratton, 2016), **Waag | technology & society** formulated a mission for digital public spaces called the Public Stack in 2019. The difference between the Stack and the Public Stack lies in the core values embodied in the principles the latter rests upon, and the design process it encourages. The Public Stack departs from the private and state-centric conception of The Stack described by Bratton. While The Stack is built upon closed design processes resulting in proprietary technology, the base layer of the Public Stack orbits around common values of fundamental rights and socioeconomic considerations, which are embodied in the open design processes involving all stakeholders to provide democratic governance of digitalisation. The resulting tech layer is open-source and ethical. There are no users, but digital citizens. A broad coalition of media and academic institutions was also formed in the Netherlands under the name Public Spaces, supporting public transition to an open software, whose operations are based on civic values.

Waag Society for old and new media (lately renamed as Waag Futurelab) in Amsterdam was founded in 1994. It is informed by the ethos of the feminist hacker movement, as Marleen Stikker, its director, is one of the founders of **The Digital City** (**De Digitale Stad,** 1994), the first virtual community introducing free public access to the internet in Amsterdam. In the 1994, **The Digital City** was one of the first free internet providers and also the site where political parties and newspapers made their first digital steps. The municipality of Amsterdam opened its entire administrative information system, becoming the first open government. (Baumgärtel, n.d.) With The Digital City, as well as other online communities, the line between public infrastructure and art project is unclear. In 2011, archival work was started under the name of **re:DDS** project to make the heritage part of the Amsterdam Museum. (de Haan, 2011) Trying to retrieve as much as possible of the early days, being hardware, code and files, and media headlines as 'web archaeologists excavate a digital city' the gathered material became part of the permanent collection of the museum. (Teffer, 2014) In 2016, under the name **The Digital City Revives**, the search for old material and the preservation of digital heritage continued and the case study was honored with a Digital Preservation Award. (The Digital City revives)

Examples of online digital communities that merge art, activism, cultural infrastructures, and community care, such as **The Digital City, The systerserver, Node9**, and many others, have existed on the internet for more than 20 years, long before the corporate services we use today. Memory institutions can learn considerably more from their modes of operation and resilience for their digital cultural infrastructures and preservation initiatives than from corporate models. Given the fluid nature of networked art, Annet Dekker speaks of *"authentic alliances".* (Dekker, 2018, p. 14) The net creates an environment in which communities are formed of real people, constituted through technical, social and cultural matter. From the perspective of the conservator and other professions involved in the preservation process, it is necessary to work with speculative and procedural approaches and *"becoming part of a 'network of care' in which a collaborative approach is important to comprehend the complexities of net art".* (Dekker, 2018, p. 164)

NEAR FUTURE TRANSITIONS IN DIGITAL CURATION

Private big-tech platforms' responsibilities and rights to moderate content, as well as the trade-off between censorship and free speech, have been the subject of a contentious political debate in recent years. We are in the situation of internet, still as emerging medium without regulation, brings back an example from history of the telecommunication industry during its maturing days in the 1970's. At some point, only phones devices manufactured by the telecom operators themselves could connect to their network. The same way users of YouTube cannot talk to users of Facebook because it does not fit the interest of corporations. Imagine if broadcasters utilized proprietary signals to compete, requiring different TVs for each TV station. Consider a situation where we were unable to dial a phone number from one network provider to another. Public institutions and their policies should be more concerned about the situation of the open internet turning in large part into a proprietary domain.

This should be taken into account when designing and choosing exhibition spaces for digital archives of cultural heritage. Corporate content platforms failed to provide a place for cultural discourse or education. Instead, they were strengthened and reinforced as attention-driven tabloid advertising services. As private walled gardens, they deliberately lack transparency and interoperability based on technical standards. Even if history is showing us that the walled gardens are disappearing and in posunout na další řádek the long term are replaced by open ecosystems that eventually bring more value, they are often the way to the most profitable business in the early days of any industry.

Although information infrastructures had undergone a long development from monolithic and isolated systems to modular and interoperable, the general use of prefabricated and presumptive tools still inevitably interferes and inhibits critical, independent, thinking. As Johanna Drucker puts it:

> *"The cultural authority of digital technology is still claimed by the fields that design the platforms and protocols on which we work. These are largely fields in which quantitative, engineering, and computational sensibilities prevail. Tools for humanities work have evolved considerably in the last decade, but during that same period a host of protocols for information visualization, data mining, geospatial representation, and other research instruments have been absorbed from disciplines whose epistemological foundations and fundamental values are at odds with, or even hostile to, the humanities. Positivistic, strictly quantitative, mechanistic, reductive and literal, these visualization and processing techniques preclude humanistic methods from their operations because of the very assumptions on which they are designed: that objects of knowledge can be understood as self-identical, self-evident, ahistorical, and autonomous."* (Drucker, 2012)

The process of critically making media architectures at the level of computing, design, technology, information modeling, data structures, interface, and protocols should transform the theory and practice in digital curation. As fundamental tenets of cultural platforms, inclusive social tools of digital curating and preservation should permit critical reading, qualitative methods, support paratextual apparatus, invite widespread performative involvement, and promote conversation.

Media artists and free software developers, previously the first inhabitants and thinkers of the empty internet space, continue to create and shape ethical networks. There are already several open social protocols being used by websites to talk to each other, which could connect archive repositories and collection systems. Open public standards in federated social networking already provide solutions without controversies of deplatforming or dividing corporations and digital curators are starting to incorporate them into digital art infrastructures. In thousands of repositories spread out across memory institutions and present in their cultural preservation strategies, social networking can offer infrastructure for equitable and environmentally conscious communication and activities. Aware of the fact that what determines art is often found in relation to broader social alliances, Annet Dekker pointed out, that it is not uncommon for networks to form around artworks that are collected by museums, large institutes, or private collectors:

> *"I suggest that such a network could evolve into a network of care that maintains or conserves (parts of) an artwork, consists of a combination of experts and non-specialists, and introduces knowledge from a variety of fields and backgrounds." Conservation thus "is less about conserving materials and more about the preservation of social information and relations."* (Dekker, 2018, p. 14)

However, carbon imbalance measures the time to rethink long-term preservation strategies. Because the only possible digitization and long-term preservation projects are those that are within the limits of sustainability. The trustworthy repositories and curatorial practice should be seen from the perspective of their ability to maintain art together with the biological livability of the interconnected environment.

One of the strategies of datacenter operators is increasing efficiency and optimization. That is not difficult to accomplish, it saves money, and it does not change too much the existing system. It is promoted that hyperscale or AI utilization control make datacenters more environmentally friendly. However, that is nothing new and will not seriously tackle greenhouse gas emissions. Efficiency is a factor that is already present

in alarming future scenarios. Despite ongoing efficiency gains, worrying energy consumption growth persists. With growing number of devices, we need several stages of ten-fold decrease steps in consumption and extensive downgrades also in terms of raw material requirements to make the exponential curve of carbon emission go flat. Datacentre buildings have embedded environmental impacts which cannot be offset by planting trees somewhere else at large scale.

Apparently, the datacenter transformation will follow the transformation of the electricity grid. Centralized power distribution is being replaced with renewables in the decentralized grid of many local sources. In the near-future grid residential houses not only produce energy, but also contain virtualized computing infrastructure, where waste heat is used for heating rooms and warm water. Distribution of computing workloads, household or transportation needs will be coordinated by smart control protocols balancing energy and computation resources availability with immediate demands. Some workloads will need to shift to more appropriate time slots, so that they do not collide with responsive workloads or priority energy flows. The 'cloud' marketing wave passed, and the 'edge' is already here. Microdatacenters are now the trend, along with edge servers and making use of network routers and endpoint devices. IDC states that carbon-neutral datacenters need 'holistic community planning' and their operators will engage in long-term urban development. Within the long-range vision the datacenters should even become the platforms for more sustainable ecosystems. (IDC, 2020) That would require urban development not only include microdatacenters in places where needed, but also their integration to blue-green city infrastructure of water and plants. In Sweden, Triple Green certification of datacenters was introduced by Bahnhof AB. Certification requires not only renewable energy, but also waste heat use for nearby households and this heating must replace other energy sources, while everyone profits in the process. Common heat pumps require warm air to function, therefore a residential datacenter seems to be the perfect fit here. Industry has historically always used energy responsibly. Heating was standard byproduct of many infrastructures and was included in the urban design from beginning. It is only surprising that this is not yet the case with big-tech, where heat is released into the air in the pursuit of rapid growth.

The publishers of **Low-Tech Magazine** have launched a solar version of their website in 2018 on a 2.5W microcomputer board powered by a solar panel and a small battery. They spent a lot of time redesigning the pages to keep the code as small as possible, and the images in monochrome. The site has an indicator of whether the sun is shining and how much energy is available. If the weather is bad for a few days, the website will shut down. You can come another day. Small single-board computers with minimal resource requirements and low consumption are appropriate for a sustainable model.

The sustainability mindset is about to be extended to large institutional systems requiring robustness and high availability. Even that is being

achieved with embedded devices. Free software is increasingly easy to manage and self-host, and recently a major shift happened in small-tech clustering technologies, that made it possible to join many computing, storage, sensor, and other IoT (Internet of Things) devices together. A little supercomputer is still consuming a fraction of electric power and materials compared to an old generation server, which can compel us to consider choosing small-tech infrastructures for public sphere projects. The potential of small-tech solutions rests upon the abundance of interconnected publishing and curatorial nodes, contributing to the building of an organizational model of cooperation between small independent galleries and major cultural and memory institutions which can mutually support and temporarily or permanently represent each other. In *Organization After Social Media*, Geert Lovink and Ned Rositter describe how organized networks have changed the practices of many types of small institutional forms as they progress from casual friendship and instant 'networking' to stronger decision-making ability with social technologies based on enduring time. (Lovink & Rossiter, 2018) In so doing, your library server can live in symbiosis next to your room plants in your office.

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AI CURATOR

ANDREAS SUDMANN

ON COMPUTER CREATIVITY:

MACHINE LEARNING AND THE ARTS OF ARTIFICIAL INTELLIGENCES

THE SO-CALLED AI REVOLUTION

In the debates on artificial intelligence (AI), one objection against attributing creativity to computers has been raised regularly for decades. It is based on the claim that they can only execute what has been designed and programmed by humans. However, already the **General Problem Solver**, developed by Allen Newell, John C. Shaw, and Herbert A. Simon, in the second half of the 1950s did not define every state of its system a priori, but linked the occurrence of rules to the conditions of their applicability (Newell et al., 1959). So-called machine learning methods, however, go a considerable step further in this respect. Their central characteristic is that they enable computers to master different tasks (automatically) without in principle being explicitly programmed to do so (Samuel, 1959). Among the existing approaches to machine learning, artificial neural networks (ANNs) have given the research field of AI a new upswing after many years of stagnation. Whenever innovations in AI have been discussed in the last ten years or so, whether with reference to self-driving cars, to the prediction of stock market prices or to the field of medical diagnostics, ANNs were always involved (Sudmann, 2018). And because of this technology, computers were also able to achieve hitherto unprecedented performance in the field of creative artistic work: AI systems, we read everywhere, can now compose music in the style of Bach or Beethoven, produce images as if they had been painted by Matisse and Monet, or generate texts that, at least at certain points, reveal a literary quality that seemed completely impossible just a few years ago.

In the art world and creative industries, reactions to the recent AI boom have, as expected, been very mixed. For some, whether artists, journalists or scientists, the current manifestations of AI represent a source of inspiration, an interesting tool, or a productive intellectual challenge, for others, an outrageous exaggeration or even an existential threat. Admittedly, such contrary assessments have a long tradition. Regardless of the specific topics and fields of application, fundamental debates about the potentials and limits of AI have always seemed to be particularly polarizing. Against this background, the following considerations are also informed by the question of how not only the developments and promises of AI, but also its critical perception and discussion, especially in connection with problems of art and creativity, can be critically reflected upon.

AI CREATIVITY – SOME HISTORICAL REMARKS

A reliable starting point for such an intervention is to situate current phenomena in their respective historical contexts. For example, it is worth remembering that the founding document of AI research, the proposal for the Dartmouth Summer Research Project on Artificial Intelligence, written 1955 by John McCarthy among others, already highlights "randomness and creativity" as a relevant field of research on intelligent machines:

> *"A fairly attractive and yet clearly incomplete conjecture is that the difference between creative thinking and unimaginative competent thinking lies in the injection of some randomness. The randomness must be guided by intuition to be efficient. In other words, the educated guess or the hunch include controlled randomness in otherwise orderly thinking."* (McCarthy et al., 1955, p. 2).

From today's point of view, the description of the connection between creativity and randomness may not be merely obviously incomplete, but under-complex. After all, the impression is given here that randomness is a kind of ingredient which, as a component of a recipe to produce a creative machine, merely has to be provided in the right dosage and for which, in the end, the most important thing is to ensure that it proves to be effective under certain conditions ("guided by intuition").

Moreover, one could probably add in the spirit of that logic that it also satisfies the criterion of efficiency. After all, even notorious skeptics of AI are willing to grant a computer so much creative power that, given sufficient computing time and capacity, it would be able to combine a correspondingly large number of words by means of random combinatorics alone and without the implementation of linguistic rules in such a way that, at some point, a poem of the quality of Paul Celan's poetry could emerge.

At the end of the 1950s, it was the computer poetry of Theo Lutz which – indeed with random combinations, but still decisively rule-based – developed stochastic texts on the electronic large-scale ZUSE Z22, a computer operated at that time by Technische Hochschule Stuttgart (Lutz, 1959; see also Bernhart & Richter, 2021).

From the 1960s onwards, artists and scientists such as Alison Knowles, Margaret Masterman, Max Bense, James Tenney and Robin McKinnon Wood each generated poetry on computers in their own way (Higgins & Kahn, 2012).

It is also not a new phenomenon that art produced by a computer looks like human-made. One of the well-known examples is described

by Michael Noll in his 1967 essay *The Digital Computer as a Creative Medium*. There he says:

"An experiment was performed using Piet Mondrian's 'Composition With Lines' (1917) and a computer-generated picture composed of pseudo-random elements but similar in overall composition to the Mondrian painting. Although Mondrian apparently placed the vertical and horizontal bars in his painting in a careful and orderly manner, the bars in the computer-generated picture were placed according to a pseudorandom number generator with statistics chosen to approximate the bar density, lengths, and widths in the Mondrian painting. Xerographic copies of the two pictures were presented, side by side, to 100 subjects with educations ranging from high school to postdoctoral; the subjects represented a reasonably good sampling of the population at a large scientific research laboratory. They were asked which picture they preferred and also which picture of the pair they thought was produced by Mondrian. Fifty-nine percent of the subjects preferred the computer-generated picture; only 28 percent were able to identify correctly the picture produced by Mondrian. In general, these people seemed to associate the randomness of the computer-generated picture with human creativity whereas the orderly bar placement of the Mondrian painting seemed to them machine-like. This finding does not, of course, detract from Mondrian's artistic abilities. His painting was, after all, the inspiration for the algorithms used to produce the computer-generated picture, and since computers were nonexistent 50 years ago, Mondrian could not have had a computer at his disposal." (Noll, 1967, p. 92).

As the media scholar Jens Schröter rightly pointed out, at that time, Noll was particularly concerned with finding algorithms that would enable the production of a work of art that could be recognized as such (Schröter, 2019, p. 303). This approach can be applied to the information-aesthetic experiments of the mathematician Frieder Nake, thus it easily exposes itself to the accusation that it reduces art to a purely ahistorical and formalistic enterprise. But according to Schröter, the works of Noll and other representatives of information aesthetics could very well be understood as historical reactions to the potentials of art in general, in this case computer-produced art (Schröter, 2019, p. 304).

EDMOND DE BELAMY, PRELUDE TO THE BOOM IN AI CREATIVITY

The renewed interest in the connection between art, creativity and AI can be related to one specific recent event. On October 25, 2018, New York Christie's made headlines with the news that for the first time in the history of the renowned auction house it has been auctioned a painting produced by an algorithm (Cohn, 2018). And an anonymous bidder had succeeded to purchase it over telephone for $432,500 which was 40 times more than originally expected.

The image, which was supposedly generated by an AI, is hardly spectacular. It shows the blurred portrait of a fictitious person named **Edmond de Belamy** who, in view of his clothing, could perhaps be mistaken for a French clergyman of the 18th century. But this association is literally in the eye of the beholder, if one considers that the AI model was trained with 15.000 images from different periods of art history before generating this portrait, which is why iconographic efforts of image analysis quickly reach their limits. And instead of an artist's signature, there is at the lower right edge of the picture a section of the algorithm ($\min G \max D \, E_x[\log(D(x))] + E_z[\log(1-D(G(z)))]$) with the help of which the image was generated. Obviously, this reference is primarily a nice PR stunt.

But the Parisian artist group Obvious, consisting of the members Hugo Caselles-Dupré, Pierre Fautrel and Gauthier Vernier, responsible for the series of generative pictures **La Famille de Belamy**, including the **Edmond de Belamy** picture, is unlikely to share this view. Instead of merely creating a work of art with AI, the project's ambition, according to Obvious, was nothing less than to *"explain"* and *"democratize"* AI with art (Vincent, 2018, online). The latter, however, obviously fits neither the framework of the auction nor the history of the portrait's creation. The Parisian artists used, or more precisely further developed, a learning algorithm that was actually put online as an open-source software by Robbie Barrat, a young man from West Virginia. The artwork was generated using so-called Generative Adversarial Networks (GANs), which were in turn originally developed, among others, by the computer scientist Ian Goodfellow.

GANs are a variant of ANNs in which a generator network and a discriminator network compete against each other in a zero-sum game. Following the training phase, one (generative) network has the function of generating sample data that could plausibly originate from the original data set, although they were only generated artificially, i.e. they are 'fake'. The other discriminative network in turn has the task to classify the generated data according to whether they originate from the original training data set, i.e. whether they are 'real' or not. The training of the GANs is repeated until the generative network produces sample data that is predominantly accepted by the discriminative network as 'real'.
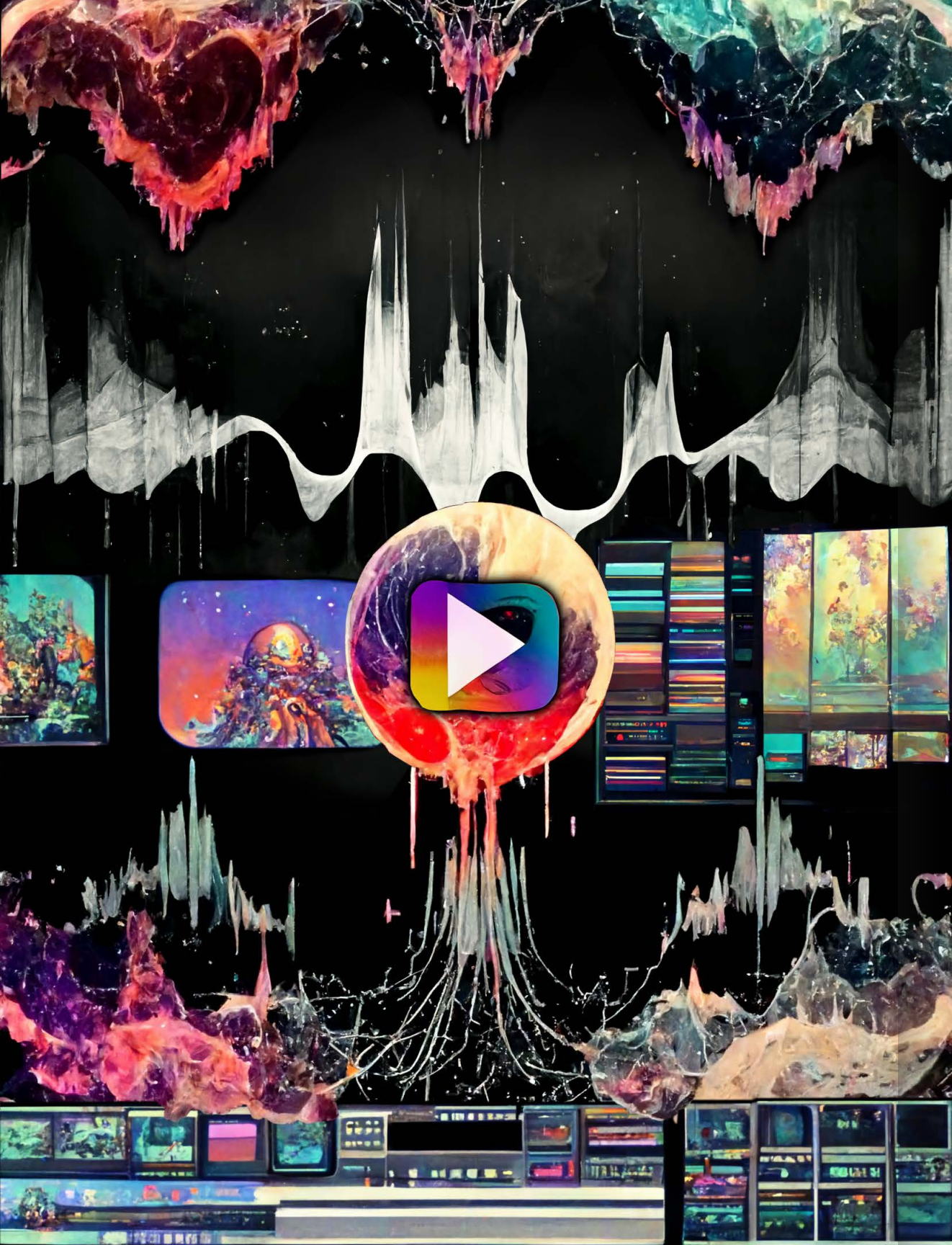
In any case, the Parisian artist collective asked Barrat if they could use 'his' algorithm for their ambition of democratizing AI art. He agreed and even helped the group with the technical implementation of their project. However, when the portrait produced with the GAN technology was finally auctioned off at Christie's, the 19-year-old was very upset. *"Am I crazy for thinking that they really just used my network and are selling the results?"*, Barrat publicly vented his annoyance via Twitter. In response to the massive criticism, one member of the group replied, *"We are the people who decided to do this,"* ... *"who decided to print it on canvas, sign it as a mathematical formula, put it in a gold frame"* (quoted in Bogost, 2019, online). Media scholar and game researcher Ian Bogost commented on this statement in an article for *The Atlantic* magazine with a quote by Andy Warhol: *"Art is what you can get away with"* (Bogost, 2019). But it is not that simple after all. Even if the big scandal around the portrait ultimately remained absent, there was still an intense debate about who is the creator and author of the image. For example, in an article of the German newspaper *Süddeutsche Zeitung*, Bernd Graff put forward the thesis that it was not the portrait but the algorithm itself that should be considered as art (Graff, 2019, online). The sarcastic comment of a humanist could be: At least these algorithms are still being developed by humans and not yet by other machines.

Indeed, it seems more important than ever to emphasize that AI systems operate not fully autonomously or automatically when they produce artifacts that pass for art or when they perform activities that are considered creative. Humans are always significantly involved in these AI-based processes in all phases of development: from the creation or compilation of learning data to the design and application of an algorithm suitable for the problem to the ongoing training of the AI model (Ernst et al., 2019).

At least in the near future this is unlikely to change, even though it has long been a reality that machines interact with machines in order to be able to optimize themselves. However, it is not only for this reason why in the debate about creative AI it is simply insufficient to again emphasize the contribution of human action in comparison with the supposedly autonomously performing machine. Instead, it would make more sense to abandon the schematic contrast and isolated view of the relationship between humans and machines and to focus on the socio-technical prerequisites for the production and formation of AI art, i.e. the specific contexts of the infrastructuring and networking of practices, knowledge and media.

Such a decentralization of the view on human-computer interaction is obviously very difficult for us, because concepts such as art and creativity are deeply anthropocentric or anthropological. We are so used to think of creative acts as results of a certain will, or to see art deeply entangled with human experiences such as joy, self-doubt, astonishment, and depending on social dynamics between artist and audience (Peters, 2021, p. 11). The list of further distinguishing features could easily be continued and differentiated, which is why we cannot simply get rid of them. Doing so, the reference to the emotional-affective aspects of human creativity

would be just as important as the reference to the physical dimension of creative work, or to the fact that creativity as a socio-cultural practice has a historical dimension. However, one thing always seems to be certain in this context: AI does not have all this. It cannot achieve all this and never will.

But the possibility of distinguishing between man and machine is not based on a static or stable anthropological difference. Instead, it marks a historical process that includes the possibility of profound, unforeseeable transformations. Accordingly, projections about the future capabilities and properties of computers are fundamentally just as questionable as all-too-convincing determinations of what machines will never be able to achieve. In both respects, as history shows again and again, experts have often been proven wrong. Besides, what AI can and can`t do was already addressed by Alan Turing and indeed most of the typical projections of AI prominent in current discourses are already to be found in his writings (Dotzler, 1989).

POPULAR IMAGINATIONS OF AI CREATIVITY

There is a recurring tendency in public debates to discuss AI only in the utopian (or dystopian) mode. The computer scientist Bertram Raphael (1971) once suggested to use AI as an umbrella term for problems *"which we do not yet know how to solve properly by computer"* (p. 101). In other words, once computers successfully master certain tasks or a solution finally emerges, they are no long considered AI.

There are several reasons for this phenomenon. For example, empirical research and development of AI technologies are strongly under the spell of their cultural imaginaries. And the latter, in turn, concerns not only the progressive potentials of technologies but, as is well known, above all their negative implications.

How often are the real-world consequences and dangers of AI in the near and distant future illustrated with images of HAL or the Terminator? But whatever shapes our notions of intelligent machines, societal fears will not be overcome by simply giving them a cute, infantile appearance or enabling them to perform amusing actions. When Boston Dynamics literally made its robots dance at the turn of the year 2020/21, this performance had obviously something uncanny about it. The emergence of this specific feeling certainly has to do with the fact that, on the one hand, machines resemble us increasingly in their outward appearance, while, on the other hand, they continue to be recognizable as machines. The latter applies for the art-project, the drawing robot **Ai-Da** (2019) as well as for the robot Ava in the movie *Ex Machina* (2015). But independently of this, this sense of unease is also influenced by the fact that media culture repeatedly confronts us with imaginations in which the difference between man and machine is not discernible. A special case in this respect is the film *The Stepford Wives* (1975). While the women ´replaced by machines´ are visually identical to their old human

appearance, the motivation for their replacement is precisely that they should behave in a fundamentally different way, which is to behave like robots in the literate sense, corresponding to the fantasies or desires of their husbands.

More importantly, the latter scenario is no longer confined to the spheres of art and popular fiction. 2018, with its Duplex telephone assistant system, Google was able to demonstrate that machines can communicate with humans within certain limits without revealing their status as non-human beings. In view of such developments, the expectation that after decades of failed attempts, computer systems will finally pass the Turing test appeared again. Indeed, it would be a milestone in the history of information technologies, but we are not there yet, although AI technologies like **GPT-3** raise expectations that this could change very soon.

FORMS OF AI CREATIVITY

As a reminder: Back in 1950, Turing proposed to replace the ontological question of whether computers can be intelligent or not with a test by means of which it should be determined whether computers can evoke or simulate the impression of intelligence. More than 30 years ago, Margaret Boden conceived of machine creativity similarly (1991/2004). The machine creativity would not be concerned with determining whether and to what extent the machines are creative or not, but whether they can, within certain limits, create the impression of creativity, by which she means producing ideas or artifacts that are new, surprising, and valuable (Boden, 1991/2004, p. 1). Accordingly, Boden differentiates three categories of creativity: combinatorial, exploratory, and transformative. These are elaborated by Boden in relation to a *"conceptual space"* as a *"structured style of thought"* (Boden, 1991/2004, p. 4) and discussed on the basis of different software applications with reference to their performances by and with computers.

As examples of programs that master a combinatorial creativity, i.e. they can combine known things in unknown ways, she used, among others, **JAPE** (Boden, 1991/2004, p. 3). This is a computer program for generating punning riddles, the original version of which was developed by Kim Binsted in 1993 as part of her Master of Science thesis at the Department of Artificial Intelligence at the University of Edinburgh.

The second type of so-called exploratory creativity aims at the exploration of a potential, which is to a certain extent already present within a conceptual space but has not yet been discovered or exploited as such. As an example, Boden mentions the composition program **Experiments in Musical Intelligence** (a.k.a. as EMI or EMMY), developed by David Cope in the 1980s. This program was already able to analyze a composition and break it down into different components, identify the style based on its patterns, and rearrange the different components into new patterns without reproducing anything identically.

The last type, transformative creativity, is characterized by transcending the boundaries of the previous conceptual space and developing a new structure of thinking. For a long time, this type of creativity could not be mastered by computers. But this changed, according to Boden, when developers such as Karl Sims and Wiliam Latham experimented with so-called generative algorithms in the early 1990s, which were based on the principle of evolutionary programming and in this way generated computer graphics of astonishing complexity (Sims, 1991, see also: Todd & Latham, 1992; Bentley, 1999).

Meanwhile, ANNs have outdone other methods that have been considered as a path toward the goal of creative AI in recent years and decades. For the time being, at least. Nonetheless, the creative potentials of ANNs are also doubted by various philosophers, artists, and humanities scholars: For example, in 2016 Matteo Pasquinelli argued that ANNs are fundamentally incapable of producing anything emphatically new. According to him, ANNs would be able to recognize patterns in already existing data purely inductively, but they would not be capable of what Peirce calls the operation of abduction. Hence, ANNs would be unable to achieve, what Margaret Boden called transformative AI.

Also, the media philosopher Dieter Mersch recently reproached those who, like Margaret Boden, are willing to ascribe creativity to computers for mostly using simplistic and historically outdated definitions of art and culture as a basis and at the same time consistently disregarding a specifically *"epistemological dimension of the aesthetic"*:

> *"Persistently they ignore what art makes art in the first place: Reflexivity as the opening up of a different knowledge. Instead, under the sign of a preference for rationalism and hard sciences, a direct connection is drawn between 'natural' creative activities such as the development of life and the 'social' or 'historical' virulence of the arts, regardless of essential incompatibilities. If, on the other hand, we insist on the persistence of an aesthetic reflexivity as a criterion for art, it is because this reflexivity is not drawn from perceptual extensions, subjective expressive excesses, or the representation of borderline phenomena, just as little as the properties of art can be inferred exclusively through its 'works'; rather, these always 'acquire' a transformation and displacement of art itself. Art is always art about art; it therefore implies in every act and artifact a transformation of the aesthetic itself, whereas most models of an artificial creativity are oriented to continuities and remain attached to an anachronistic nineteenth-century cult of genius, which in turn owes itself to a vulgarization of the Kantian definition of genius"* (Mersch, 2019, p. 73).

Even though, we can list some examples of computer scientists who use extremely reductionist models of creativity (see Langley et al., 1987), still the latter accusation seems a bit sweeping. Back in the 1980s, for example, computer scientist Marvin Minsky criticized that people tend to exaggerate the difference between ordinary and outstanding achievements in terms of their creative thinking (1982). At least in this case, there can be no question of a cult of genius.

In general, a fundamental problem with the debate on AI is that we typically value and admire those achievements of machines that we also value and admire related to humans. If a computer beats the human world champion in the board game Go, it is a sensation that is reported globally in the media. However, there was much less public interest in 2017 when an AI model was able, for the first time, to recognize actions and gestures using ANN-based methods and based on training with video data, i.e. when it was able to master, in a basic form, what is commonly referred to as common-sense knowledge in relation to humans (Sudmann, 2016, 2017). It was not acknowledged that the step of enabling an AI to visually perceive and recognize its environment is much more fundamental and far-reaching – not least for the development of advanced systems that will eventually be capable of human-like creative behavior – than the well-known high-profile developments like **AlphaGo & Co**.

GENERATIVE ADVERSARIAL NETWORKS

One may also be skeptical whether Generative Adversarial Networks (GANs) or their more developed successors as Creative Adversarial Networks (CANs) will raise the performance of an AI in terms of creativity to a new level in the medium or long term. CANs essentially copy the functionality of GANs but add a decisive component to the algorithmic operations: The discriminator network still has the task of classifying images according to whether they are real or fake, but also learns to assign these artifacts to 25 art styles (like impressionism or surrealism, etc.). Accordingly, the generative network still has the function to generate images that the discriminator considers to be real, but in addition to that it is supposed to make the assignment to these art styles impossible. The performance of these creative algorithms thus consists in a fixed scheme of deviation from a norm as an iterative optimization process. Hence, CANs deviate decisively from what characterizes deviation from established art styles with regard to human creativity, namely that as an artistic operation it is itself always up for disposition in relation to a historical norm, i.e. it is uncertain (Elgammal, 2017).

As a result, the computer art produced by CANs may even be more interesting than many works by human artists, and this would be solely

based on their validity (in German: *Geltung*), and not merely in accordance to their specific genesis. Moreover, it can be assumed that the act of deviation from a defined norm is significantly more complex in CANs than in the case of human art production, simply because an AI system can be more familiar with the virtual archive of art than any human artist.

Perhaps people must learn to live with this narcissistic slight. In any case, an artist like Roman Lipski has long been using an AI system that works with machine learning algorithms as a 'muse'. He feeds it with his own art works so that the machine can suggest what his next piece of art might look like. However, the artist's linguistic use of the concept of the muse is not entirely appropriate. This is not because the concept of the muse is transferred to a machine, but because the muse is characterized precisely by the fact that it does not directly intervene in the production of the work of art. In this case, the AI system is simply an analytical tool.

But even this approach is not new in the field of computational creativity. In the 1980s, while he was supposed to compose an opera, but suffered from a creative blockade, David Cope developed the already mentioned AI program EMMY to be inspired by its compositions, based on the analysis of his own work. Whether in the end he was able to come up with more interesting results than he would have at some later point without the help of his program, cannot be answered anymore. Hence, perhaps the real achievement of the program was simply to serve a therapeutic purpose.

THE FUTURE OF MACHINE CREATIVITY AND THE NOTION OF ART

Whatever the future of machine creativity may look like, at best its development and reflection will help us to re-examine socio-cultural perceptions and practices of art and creativity in the very light of these technological changes. It remains to be noted that the societal use of concepts like art and creativity, insofar as they relate to humans, is determined by a striking paradox that also inscribes itself into the current AI debates: on the one hand, these terms are used in such an inflationary manner that basically everything under the sun can be considered as creative or art, while on the other hand, there is a tendency to mystify and esoterically transfigure corresponding artifacts and activities.

In this respect, the current discussions about computer creativity should also challenge us to take seriously the contradictions of human creativity and art production and to question, for example, how machine-like or not they are, particularly under conditions of an industrial and post-industrial society (Sudmann, 2019).

Figures 1 and 2:
Images were created by Julia Herbach with the AI tool Midjourney

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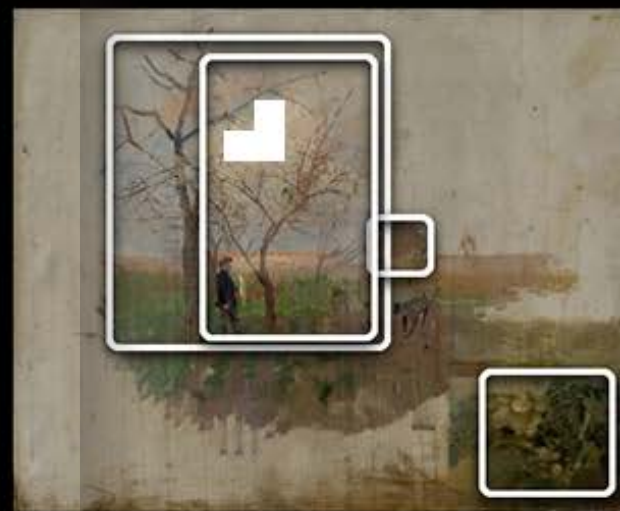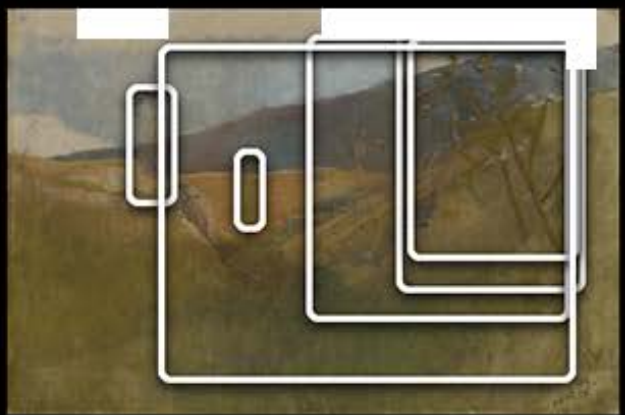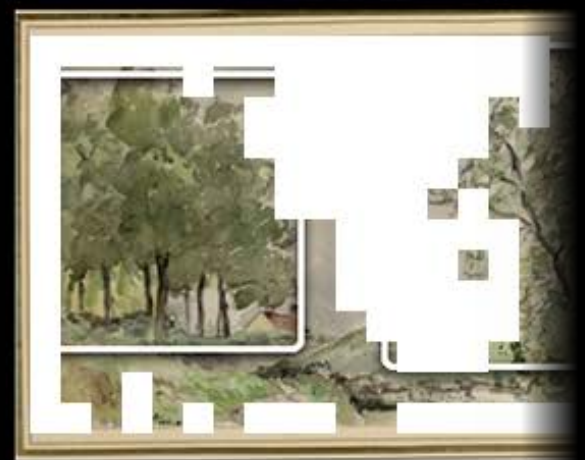
DIGITAL CURATOR AT THE MUSEUM OF FINE ARTS

LUKÁŠ PILKA

WHAT CAN THE MACHINE VISION SEE?

If we examine a painting in a gallery, we can see it contains an array of different things. When we are looking at it from a distance, we are likely to be drawn to its dimensions or overall composition. When we edge closer, we discern the abstract style of the painting, our eyes follow the lines, surfaces, edges and shapes. When the style of the painting is representative, we start to explore a motif, a figure or the elements and how they are spatially arranged. In the case of a portrayal of a human being, our eyes will naturally turn to the face, the features and gestures depicted, the position of the body or the attributes of the figure. We might also be intrigued by the creative style, the schematic aspect of the image, or the specifics that emerge from the artist's handwork, such as brush-strokes, contrasts, or the color scheme; we might even pay attention to the unique and defining artistic signature.

Machine Vision tools and human eyes both possess numerous ways and methods of visioning the world. Just as there are many ways of observing with the human eye, there are a variety of machine vision tools that can be used in the analysis. Each of these methods highlights a unique aspect of images as well as an interpretation. Thus, by the use of specialized algorithms, one can analyze in a different manner colors, contrasts, shapes, search for similar images in large collections, compare painting the handstyles of different artists, and classify artistic styles.

In my work on the Digital Curator project, I investigated these approaches. The terms capture a collection of software tools, experiments and applications that I created during my PhD at the Academy of Arts, Architecture and Design in Prague. Ultimately, these tools aim to bring novel perspectives in respect to the study of artistic creations. Even though some of these outputs are online and accessible at **digitalcurator.art** and **atlas.digitalcurator.art**, there are several others that do not presently have a user interface, and thus my descriptions and examples explored here will be derived from a limited sample of my work.

Three different experiments will be presented in this text. The first one is called *Curator of Art Techniques* and focuses on the automated classification of various drawings, paintings or prints. Here, an algorithm takes on the role of an expert, who classifies whether a particular canvas is an oil painting, watercolor, a woodcut, or an engraving. The second experiment titled *Curator of Taste*, focuses on collections that have appeared under the guidance of a curator. It is a speculative attempt to extrapolate the formal tastes of curators, in this case illustrated in the painted collections of Rudolf II, and apply them to a look at later works of art produced outside the given circle. This experiment created specialized neural networks that reconstructed the tastes of long-dead curators based on works that once belonged to their collections. The provocative question was whether the aesthetic preferences of people from the past could be reconstructed in this way.

The final section *Curator of Symbols* analyses iconographic analysis and genre classification. In this case, the neural network algorithm has been trained to classify motifs and themes, attempting to capture their significance, identify the works on which they appear, and conduct frequency analysis to determine why their popularity reigns over time.

DATABASE

Despite the fact that the principles of computer vision are rooted in linear algebra, the data itself is more than merely mathematics. Arguably, it is the responsibility of the curator or art historian to continuously use their critical eye concerning the specific data, take an active role in its selection and to also suggest changes to its composition, form, and processing techniques. Here, the composition of sample datasets for machine learning can influence how the algorithm comes to evaluate and potentially shape the outcome of the research. We will therefore proceed to outline the data that the Digital Curator handles.

The Digital Curator database can be compared to the collection of an art museum or gallery. More specifically, it is a collection of digital reproductions of artworks that an algorithm has at its disposal to search, filter, sort, label, group, and in orderlink, to create datasets and shape their context. The works included in the database are accessible and processable by the program; the others, although they can be published online, are left out by the Digital Curator. Even so, this is probably the largest collection of reproductions of Central European art that can now be handled by algorithms.

From the summer of 2022, the Digital Curator's collection contained 196,000 works, mostly paintings, drawings and prints from the holdings of 90 museums in Austria, Bavaria, the Czech Republic, and Slovakia. It included reproductions of exhibits from the Albertina in Vienna, the Belvedere, the Alte Pinakothek and Neue Pinakothek in Munich, the Prague City Gallery, the National Gallery in Prague, the Moravian Gallery in Brno, the Slovak National Gallery and a number of smaller collections – from the Benedictine Abbey in Ottobeuren, West Bavaria, to the East Slovak Gallery in Košice.

The database's focus on Central European institutions responded to the shared cultural history of the region, where artists have traveled for centuries between cities, aristocratic courts, workshops, schools and academies, sharing their artistic style, formal elements, genres, themes and motifs. It was not only the artists themselves who traveled, but also paintings and entire collections that gradually changed owners and locations. Once related works of art are now spread across hundreds of museums in several independent countries, and to get a handle on even a small fraction of this heritage is beyond human capacity.

Regarding the database's composition, it should be highlighted that despite its large size, it could not and cannot be statistically representative. There are no collections in museums that represent period art

production, but only an incomplete sample representing past and present curatorial preferences. In addition to this bias, the dataset also reflected the (un)willingness of individual institutions to share their collections, their priorities in digitisation, and the effects of time. It is a well-known fact that the deeper into history our interest goes, the fewer artifacts we have available. But how great is this disparity? Just 1.3% of the Collection's assets, as determined by the Digital Curator dataset, are made up of all works of art that date back to 1500 or before. Respectively, the database has 36,658 pieces from the first half of the 20th century compared to just 314 from the first half of the 15th century.

Looking at these numbers and the accompanying graph (Figure 1), we can easily see how much the amount of artifacts varies between periods. This variation causes a partial problem when comparing phenomena across periods. In order to track their decline, stagnation or growth, it is necessary to harmonize the values and use proportional representation. Thus, when the Digital Curator makes a chronological comparison, he is not interested in the absolute number of artifacts with a given characteristic, but in their share of the total number of objects in a particular period. For example, the following histogram comparing the frequency of depictions of men and women across history shows that around 1400, the machine vision algorithm recognized a woman in almost 60% of the images, and the opposite sex was present in about 25% of the works (Figure 2). For this period, the sample examined consisted of only about three hundred works, whereas for the period around 1900 it already contained tens of thousands of images.

Exponáty dle roku vzniku
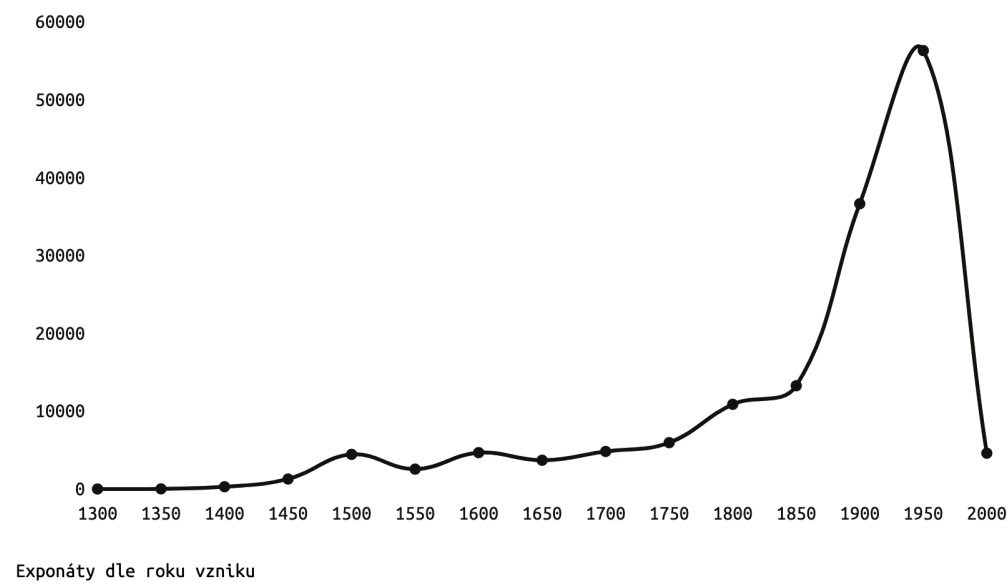
Figure 1: Composition of the Digital Curator database by year of exhibit creation. The horizontal axis shows the median year of (presumed) creation of the work, the vertical axis the number of works in the database. Author: Lukáš Pilka

Muži: 19825 artefaktů
Ženy: 17015 artefaktů
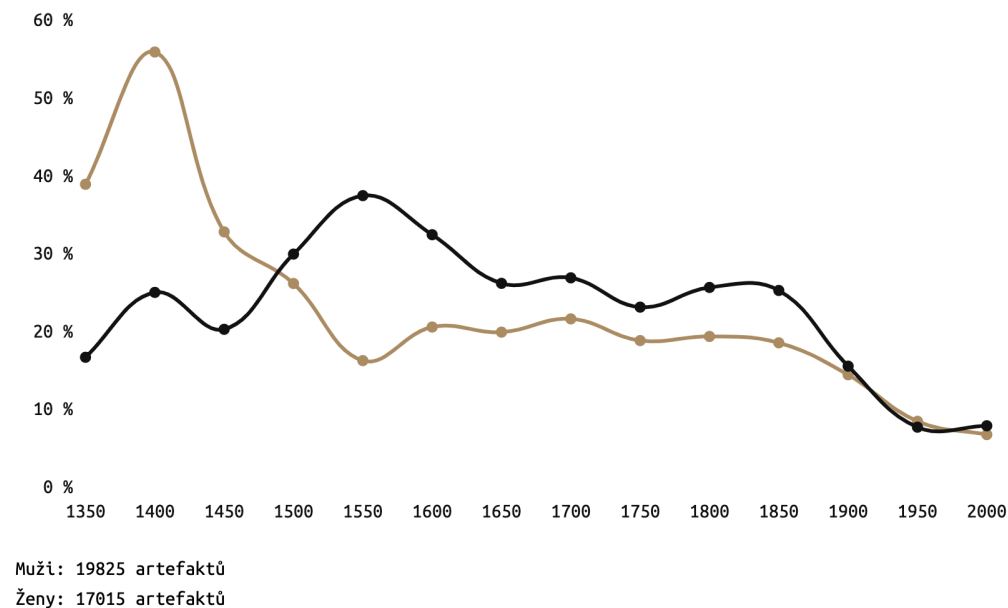
Figure 2: Proportion of men and women depicted across the centuries. The chart shows the proportion of images in which computer vision has identified a male and female figure. Author: Lukáš Pilka

CURATOR OF ART TECHNIQUES

Recognizing the technique of a work is one of the basic skills not only of connoisseurs of "art historical craft", but of virtually anyone who has come into contact with the visual arts. Even young children in kindergarten learn to distinguish between drawing (crayons) and painting (watercolors), and thus acquire the basics of this kind of classification. In the world of museum collections, however, the situation is often a little more complicated. We find techniques detailed in much greater depth on labels in gallery halls or on reproductions in exhibition catalogs, and there are even hundreds of distinct types of techniques in the Digital Curator database. These range from succinct descriptions such as "woodcut" or "oil painting" to elaborate statements indicating the often very subtle nuances in the methods and materials used. For example, the technique for Gustav Klimt's famous Kiss is described as follows:

"Figure surface: gold leaf, gold paint (gold powder dispersed in a medium), silver, platinum, lead, oil painting, on canvas painted with zinc white: Metal (brass), painted with glazes." (Belvedere Museum, 2022)

The record indicating the artistic technique of the given work has a purely practical character. It serves in categorizing and cataloging the collection, is used for searching and filtering, or helps in navigating museum systems and online catalogs. Additionally, the process of "creating art objects" is the main focus of numerous theoretical and historical treatises. One need only think of the publications devoted to the importance of oil painting in Dutch art or the invention of copperplate and its influence on South German Renaissance art. Alternatively, one can look up relevant keywords in the Google Scholar database and see how many results are returned, where for example, for the term 'woodcuts and engravings' the application returns 35,500 entries, for 'oil painting' there are 374,000, and for 'lithography and etching' as many as 534,000. (Google Scholar, 2022)

To distinguish a painting from a drawing is an easy task, but it takes a trained eye and a certain level of proficiency to tell an etching from an engraving or lithograph. The aim of the first experiment was therefore to test whether this ability could be transferred to a neural network algorithm, and if so, to use this program to check and complete the metadata about the artifacts – despite the fact that all of the Digital Curator data came from museum collections, the record of art technique was available for only a part of them. This information was completely absent from certain collection objects, while it was present but unclear for others (curators used terms that could not be unified during data cleaning). Additionally, not all curators have complete trust in their data, so if the algorithm could acquire a certain degree of confidence, it might be used to spot inconsistencies in records already in existence.

In this experiment, a supervised learning method was applied, where the resulting program can independently classify the items under investigation into predetermined categories. In this case, the "teachers", i.e., the persons preparing the sample data, were the museum staff themselves, who prepared the metadata contained in the Digital Curator database. This was a secondary use of their work – probably very few curators and collections managers anticipated that the data they were collecting concerning artistic techniques would be used to derive these cognitive capacities.

The first step was to select groups of art techniques and collect hundreds of sample reproductions from which the algorithm would extract its skills. For this purpose, it was possible to use part of the existing database, find out which art techniques are most frequently found in it, and prepare the necessary number of study samples according to them. The machine learning dataset was composed of over 3,000 photos sorted into 14 categories following numerous experiments and iterative changes. Among them were: watercolor, woodcut, photography, pen drawing, pencil drawing, charcoal drawing, etc.

During the learning process, the algorithm decomposes the sample images into individual pixels and through the changing distribution of weights among the neurons, it looks for a configuration that can capture the shared properties as precisely as possible. To accomplish this, it divides the sample data into two groups – while the training set is used for learning, the test set provides information about accuracy – and each time the weights are rearranged, the program attempts to estimate the categories (art techniques) for the test set and then determines what the success rate of classified images. The algorithm gradually improves as a result of this feedback and subsequent iterations until it reaches its limit, at which point the learning process stops. The attached graph illustrates the progression of model improvement – while the algorithm achieved less than 30% accuracy on the first attempt (assigning the correct art technique to 30% of the reproductions in the test set), it reached its peak with an accuracy of about 65% on the 20th iteration (Figure 3) In other words, there is a two-thirds likelihood that the algorithm will correctly attribute an art technique to an unknown reproduction if we now ask it to do so.
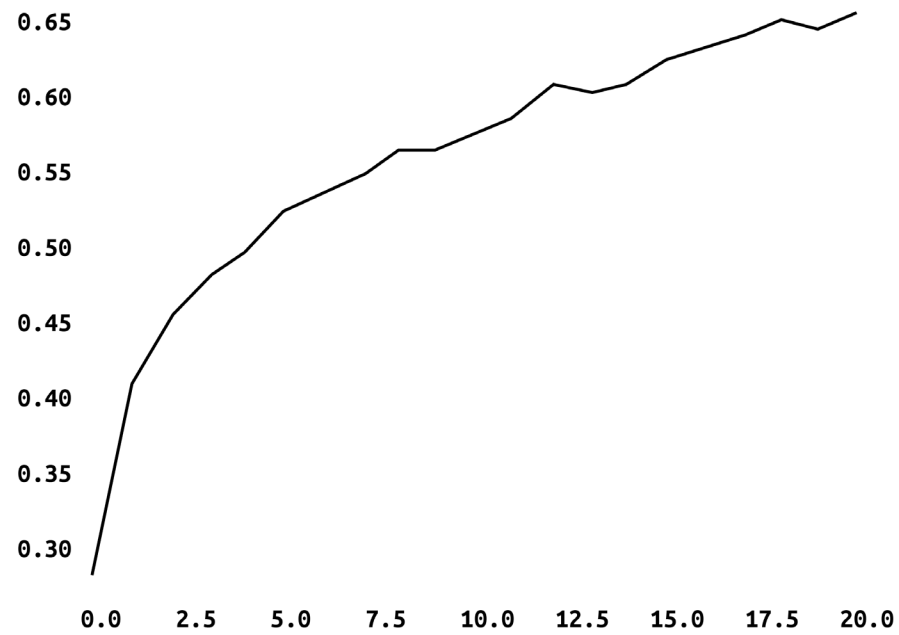
Figure 3: Training an algorithm for detecting artistic techniques. The graph shows the learning process of the neural network. The horizontal axis indicates the iterations, and the vertical axis indicates the accuracy that the algorithm achieves with regard to the test set.
Author: Lukáš Pilka

Figure 4: Sample of artworks for which the algorithm determined the art technique "charcoal drawing".
Author: Lukáš Pilka

Figure 7: Sample of artworks for which the algorithm determined the art technique "etching". Author: Lukáš Pilka

CURATOR OF TASTE

In a recent experiment, we demonstrated that neural networks can detect and categorize artistic techniques. However, could this technology be utilized to classify images into less recognizable categories? For example, to estimate its association with a particular art school, group of artists, exhibition, show, or individual collection? Is it possible to go even further and create an algorithm capable of replicating curatorial taste? If today's generative neural networks produce music, writings, or paintings based on databases of works by long-dead artists, why couldn't we also resurrect legendary collectors like Lorenzo de' Medici or Daniel-Henry Kahnweiler and ask them whether they would select this or that piece to their collection? As an alternative, how about looking for paintings that are formally comparable to these collections and determining whether these similarities point to any deeper connections between the pieces of art?

There is a tendency for major styles as well as some smaller ensembles of works to have a similar aesthetic. When we speak of workshops, schools or circuits in the visual arts, we frequently refer to formal similarities between individual artifacts. Other groups, however, were formed through a variety of external circumstances, and their composition can be visually quite disparate. Artists were admitted to aristocratic courts on the basis of recommendations from masters or professors; they joined societies or groups on the basis of shared opinions and attitudes; they may have been included in an exhibition through the efforts of gallerists or art dealers, and so forth. The machine vision algorithm cannot take into consideration these (not only) social settings because they are not inherent in the visible layer of the artwork. The absence of context can be both advantageous and disadvantageous, on the one hand, historical knowledge is omitted, but on the other hand, the works can be compared with the "innocent eye" of a program unburdened by a predefined context.

As foreshadowed in the introduction, this experiment focuses on the tastes recorded in the collections of Emperor Rudolf II. These collections were intended to encompass the total diversity of the world at the turn of the 16th and 17th centuries and to be a representative manifestation of the metaphorical concept of the Theatrum Mundi. The collections included objects from every known continent, representing a wide range of human interests and diverse components of animate and inanimate nature. They included minerals, semi-precious and precious stones, fossils of plants and animals, stuffed animals, skeletons, skins, antlers, bezoars, technical devices, clocks, astronomical instruments, historical artifacts, copies of ancient works, and contemporary (late Renaissance and Mannerist) works of art in the fields of glass, jewelry, sculpture, drawing, printmaking, and painting.

From the perspective of this experiment, the most noteworthy is Rudolf's painting collection, which represents the source of paintings for the sample dataset. This collection included allegorical and mythological works, genre paintings, especially landscapes, still lifes with flowers and various representations of fauna and flora. It also included a set of portraits and allegorical works reinforcing the emperor's status, as well as a number of paintings with erotic overtones. On the other hand, depictions of religious motifs were not often found in the imperial halls, although the "Rudolf artists" themselves also executed a number of commissions for church clients (Horská, 2018, p. 22).

The painters (and artists in general) who worked for Rudolf II were seasoned masters from many artistic centers in Europe who settled in Prague. The nature of art at Rudolf's court was therefore initially very diverse. Thus, It is therefore only conceivable to speak of the "Rudolphine style" in the context of the period at the turn of the 16th and 17th centuries, when artists had been working in one place for a long time and were influencing each other (Zlatohlávek, 2012).

The sample dataset of Rudolphine works was derived from Thomas DaCosta Kaufmann's book *The School of Prague: Painting at the Court of Rudolf II*, which is based on contemporary inventories and archival sources and is the most exhaustive source on painting collections of the time. The resulting database contained 328 paintings from 29 artists. The range of artists included well-known names such as Hans von Aachen, Giuseppe Arcimboldo, Bartolomeo Spranger and Joseph Heintz, as well as lesser-known artists such as Daniel Fröschl, Paul Vredeman de Vries and Johann Geminger.

If we want to train a neural network to recognize a certain phenomenon, we must frequently prepare not just an example dataset containing images of the phenomenon but also a negative set in which the observed element does not exist. For example, if the goal is to create an algorithm that recognizes a cat, we need to collect and label photographs that include the animal, as well as those that do not include the animal at all. What exactly should a picture with a "non-cat" look like? Simply put, there should be a wide variety of photographs showing potential settings in which the cat might be present but is not. Adopting a similar approach, we also require pieces by "non-Rudolphines," or painters unrelated to the Prague court, in order to develop a program that reflects the aesthetic preferences of the Rudolphine painting collections.

How to define these "non-Rudolfers"? If the taste of the imperial curators is a difficult-to-grasp abstract phenomenon, how can one pick works that do not include this phenomenon without committing biases based on one's own preconceptions and preferences? For the time being, it seems most prudent to identify as non-Rudolphine all works that were made before Rudolf's adulthood and hence could not have been influenced by his collecting tastes at the time they were created. However, the negative dataset did not include any works produced after the Emperor's death. The rationale behind this is the belief that the themes, style, and taste of Rudolphine painters persisted long after the monarch's death. Indeed, finding works that remained influential subsequent to the Monarch's reign was one of the aims of this experiment.

The first part of the technical realization was carried out in a similar way as in the case of the classification of artistic techniques. A neural network capable of recognizing whether a particular image originates from the Rudolphine circle was developed; – the attached graph (Figure 8) shows the learning process here as well and the resulting estimation accuracy rate of over 90%. The next step was to use this algorithm to classify 1,640 paintings created between 1612 and 1812, two centuries after Rudolph's death, and to select the works that the program deemed to be most consistent with the learnt rules.

At the moment, two sets were available: the first group contained actual paintings by Rudolphine painters, the second, slightly larger, included younger works that resembled them in unspecified ways. In total, there were 1,000 paintings. How to examine and compare these works? The Inception and UMAP neural networks used to cluster the images according to formal similarities and the Yale DHLab PixPlot visualization tool capable of drawing an interactive map with the clusters thus created served this purpose (Pilka & Hrdličková, 2022).

Looking at the atlas, we can see an "archipelago" of images, with the distances between each point corresponding to the degree of formal affinity (Figure 10). The closer the reproductions are, the more similar features they share. In some cases, the space between the icons is quite large and empty - indicating that there are no works in the analyzed data-set with characteristics that correspond to a specific location. Conversely, locations where there is a high concentration of points indicate a greater number of visually close images. It is irrelevant if the similarity is due to color, brightness, contrast, proportions, composition, shapes, edges, or surfaces, or any other phenomenon. All of these features were taken into account by the neural network method and reduced to a two-dimensional map.

In addition to the atlas itself, the program includes navigation, which is comprised of the indicated areas. In collaboration with art historian Tereza Hrdličková, we attempted to choose and name such groups that can make (at least partially) sense from a curatorial or art historical perspective. These clusters were partially created automatically using a sorting algorithm and partially drawn on the map by "human hand." Some of these collections are temporally homogeneous, containing exclusively works by Rudolphine or "post-Rudolphine" artists. In other instances (such as the Landscape with trees group) (Figure 12), however, there is a pretty substantial mixing of the two datasets and an obvious continuity between the two time periods. It is precisely such clusters that may represent a type of semi-finished product or a signpost for potential future qualitative study.

After looking at the atlas, we find that the characteristics of the clusters are different. The relationships between the grouped works are sometimes clear, and sometimes more ambiguous; sometimes they contain works with similar motifs, created with the same technique, or classified in the same genre; and sometimes these clusters share a similar color palette, compositional style, or painterly handwriting.
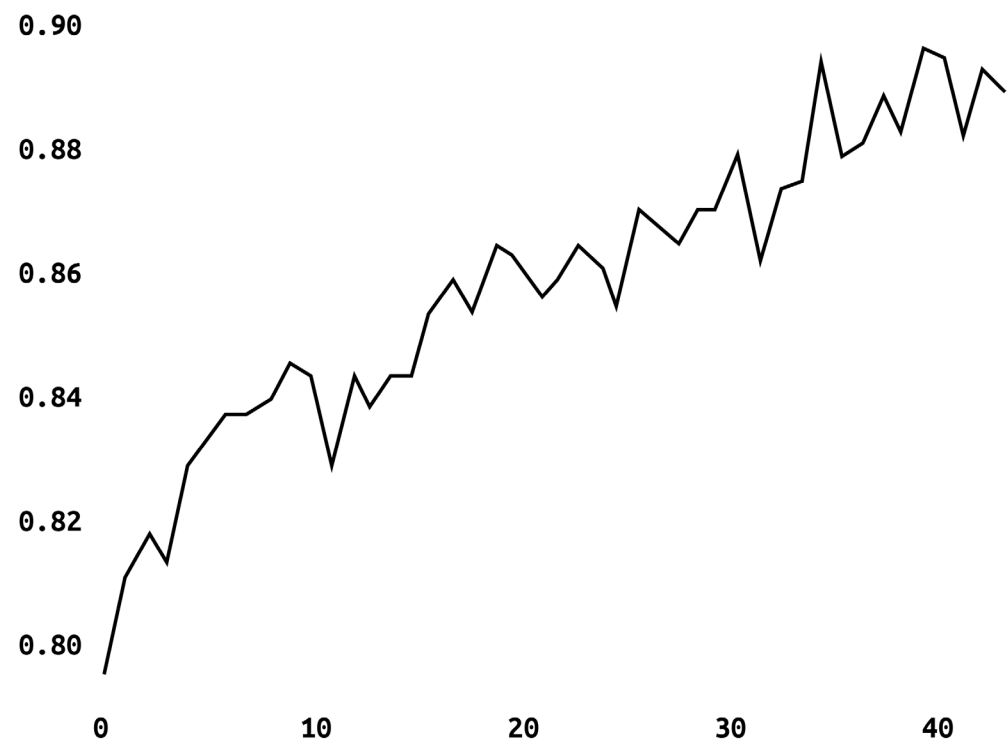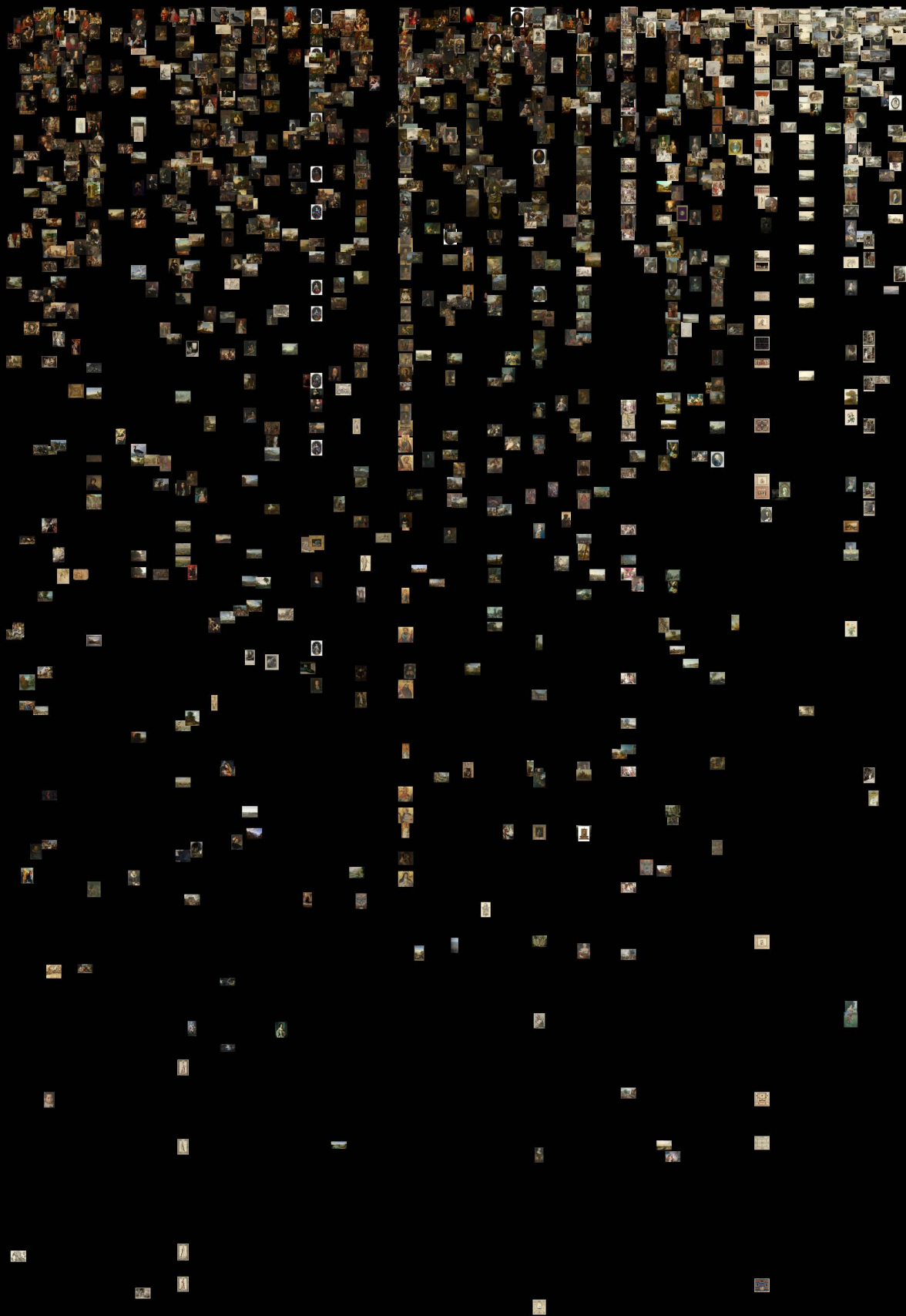

Figure 8: Training an algorithm to detect the style of Rudolf II painters. The graph shows the learning process of the neural network. The horizontal axis shows the iterations, and the vertical axis shows the accuracy that the algorithm achieves with respect to the test set. Author: Lukáš Pilka

However, their shared characteristics are typically discernible and comprehensible, they can be investigated further, and (hopefully) some can provide curators, scholars, art historians, and other art historians with intriguing suggestions. It is unclear, though, how much of this is attributable to the classification pre-selection (the inclusion of paintings that fit the Rudolphine model) and how much of this significance comes from the arrangement itself. Is the initial classification stage required? Would we achieve similar results if we compiled the atlas from a sizable collection of random works?

Despite the fact that the classification algorithm seeking to extract "curatorial taste" demonstrated a good ability to differentiate between "Rudolphine" and "non-Rudolphine" paintings, we should note this capability is primarily dependent on the definition of the negative group. The neural network *de facto* learned to discriminate late Renaissance or Mannerist pieces from earlier Middle Ages works. Clearly, there are aesthetic variations between these groupings, but to what extent are they indicative of the collections under study?

As an alternate approach to building these "taste classifiers," a different concept of negative set is presented. Works from other artistic centers of the time could be arranged in juxtaposition to those from earlier eras. Rudolph's Kunstkammer's artwork can be compared to Mannerist works from Florence, Rome, Haarlem, and Antwerp. It's possible that undertaking this approach might lead to the emergence of a neural network that is better equipped to grasp the visual essence of a specific circle or to question the existence of different stylistic variations.

Figure 10: 1,640 paintings from 1612-1812 arranged according to an algorithm with the extracted taste of the court painters of Rudolf II. The horizontal direction represents the timeline, the vertical direction the affinity of style. The higher up a given work is, the greater the correspondence with "Rudolf's taste". Author: Lukáš Pilka
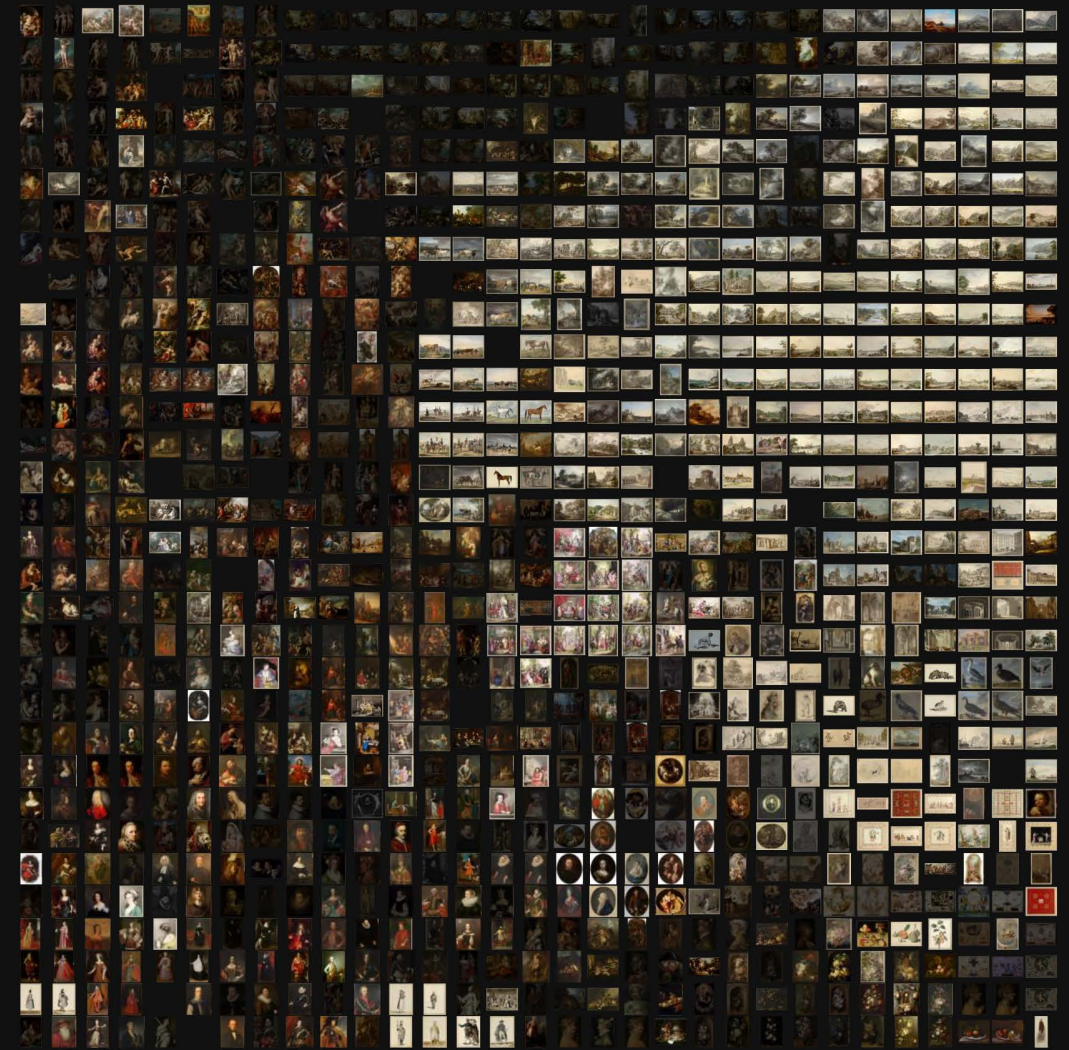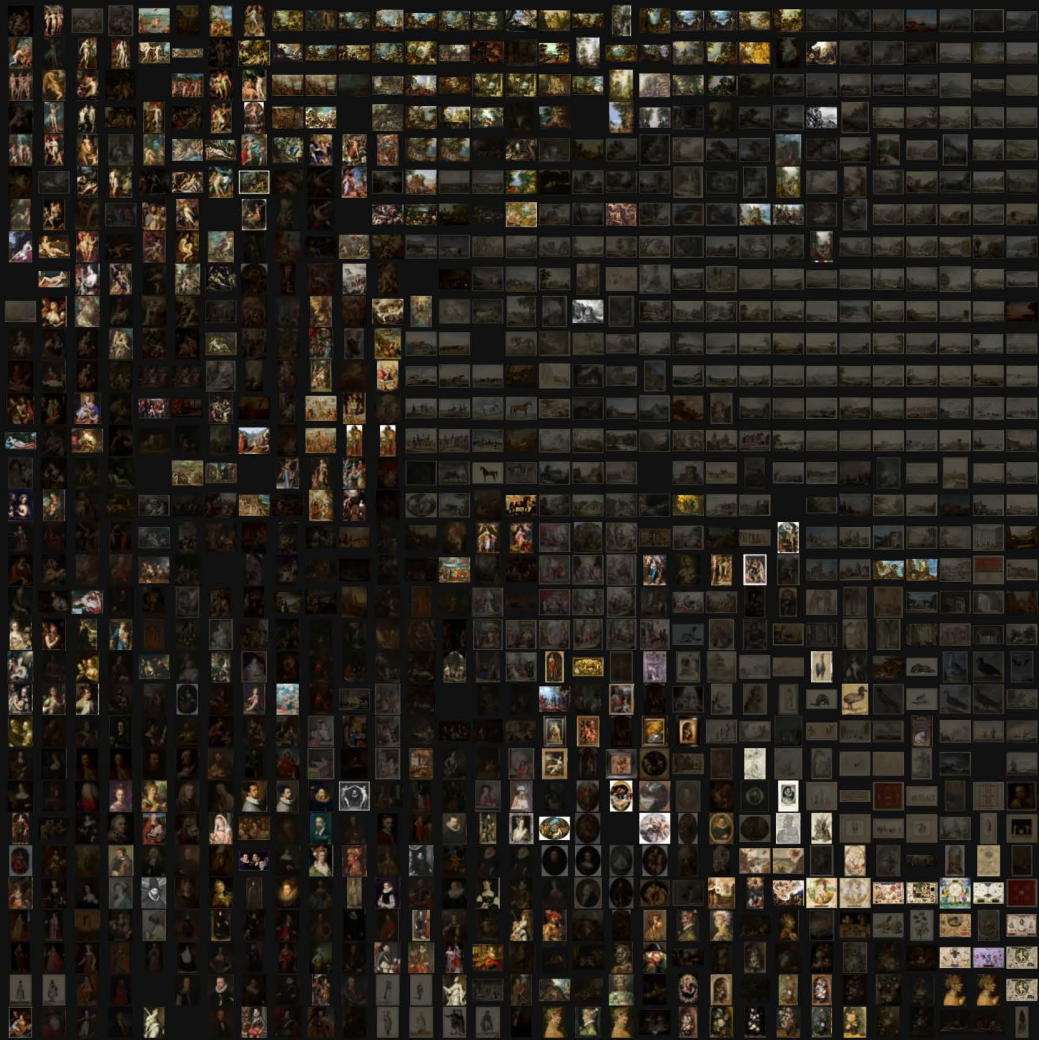
Figure 11: The visualization shows the works of the original Rudolphine painters (clearly shown on the left) and the continuation of their style from the following two centuries (clearly shown on the right). The works are arranged here according to formal similarity. Autor: Lukáš Pilka

Detail of a visualization showing the works of the original Rudolphine painters (shown more clearly on the left) and the continuation of their style from the following two centuries (shown more clearly on the right).
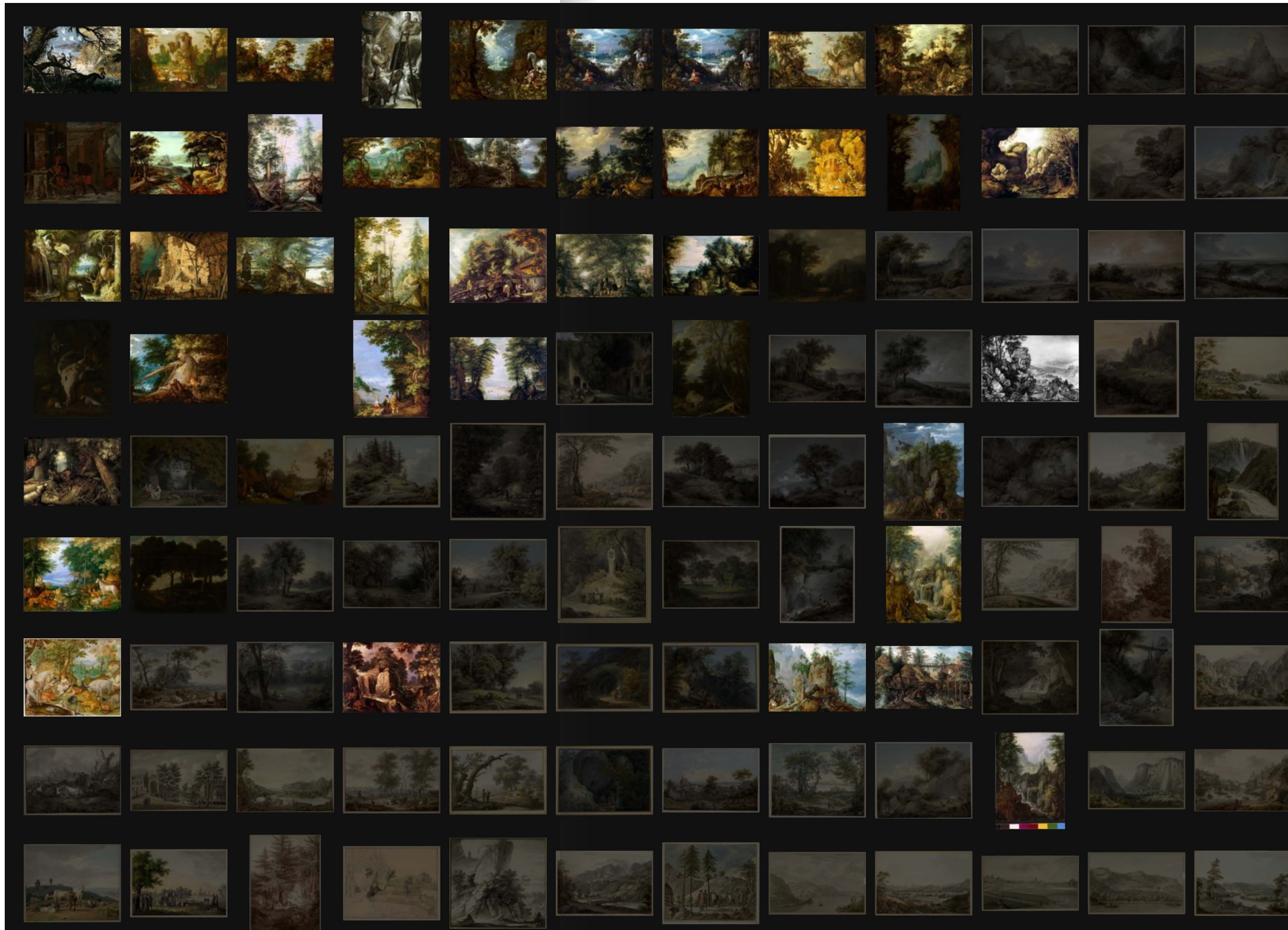
CURATOR OF SYMBOLS

One of the methods of machine vision is the detection and classification of objects in the image. In the language of engineers, an object is practically any visible element that can be identified and bound in the image by a so-called boundbox. It can be a vase, a flower, and a human face as well as an angel, a halo, or the Virgin Mary holding the baby Jesus in her arms. While computer science does not distinguish between the meanings of these elements in its terminology, art history goes a little further in this direction. At the very least, there are terms with established meanings, such as motif, symbol, and genre.

Typically, a motif is an observable element in a piece of art; it can be specific or abstract, and its definition is closest to that of an information object. Some motifs have no special meaning, do not represent anything in particular, and only relate to themselves. Symbols, or icons, are visual references linking phenomena and images, in turn shaping the message and playing an intrinsic part in how the story is told. Whether it is a Pop Art print or a pre-modern painting, the effect an image can produce can be said to be created through the relationship of symbols. This is especially true in medieval art, where a complex system of meanings emerged that is the subject of interest to many scholars of iconography. They have even released a number of specialist handbooks in an effort to organize the branching collections of interconnected references and messages. Thus, the reader might discover the symbolic meaning of the goldfinch (Christ's sacrifice), the color blue (God's knowledge, heaven), or yellow (social isolation) in a medieval picture (Bartlová, 2013, p. 91–92). (Bartlová, 2013, p. 91–92).

Compared to motif and symbol, defining genre is somewhat more challenging. Within the visual arts, two meanings are associated with the term. Firstly, it can be a category of painting depicting scenes of everyday life of ordinary people – in this sense, the term was used, for example, by the theoretician Andre Felibien, who in the second half of the 17th century established a hierarchical scale among the subjects of a work and began to use it to classify paintings. (In his eyes, historical scenes were the highest ranked, followed by portraits and just genre paintings.) In a broader sense, then, "genre" can relate to the subject matter or content of a painting (Riechert, 2017).

For us, it is crucial that themes, symbols, and genres constitute a highly visible layer of the artwork, and it is therefore reasonable to believe that these aspects will also be discernible using machine vision. If these themes can be reliably searched, categorised, and demarcated, this technology might be used to examine cultural and historical data and to automatically capture, search, and link databases containing hundreds of thousands of replicas.

MOTIF AND SYMBOL DETECTION

Object classification typically uses pre-trained neural networks drawing their visual experience (in particular) from photographs of 21st century America. However, if these algorithms are employed to classify pre-modern photographs of Central Europe, we will inevitably encounter their limitations. The digital curator therefore uses proprietary neural networks designed to classify motifs and symbols, with their skills extracted directly from historical paintings, prints and drawings. To this end, a set of 3,950 digital reproductions was created. These works came from the collections of Central European galleries and dated from 1300 to 1800, and the aim was to spread the sample as evenly as possible across the centuries. These paintings were labeled with 4 167 objects representing 13 symbols associated with Christian iconography. These included, among others, the 'Madonna', 'angel', 'white dove', 'bishop's scepter', 'Latin cross', 'halo', 'crucifixion' and 'crown of thorns'." This input data served as a key differentiator between the capabilities of the Digital Curator and those of other neural networks that had been trained to recognize other objects and features on otherwise composite datasets.

The Digital Curator's neural network gradually became better at recognizing 13 common iconographic symbols, but this set was not sufficient for a broader exploration of motifs or genres. It was therefore necessary to supplement its cognitive capabilities with additional objects, for which the pre-built *Resnet V2 Object detection model* was used (TensorFlow, 2022). Although it was already a universal algorithm trained on contemporary visual materials, it might be used to identify motifs whose representation had not altered significantly over the centuries. For example, a vase, a flower, a tree, a dog or a horse have the same visual features in today's photographs as well as in Renaissance paintings. This brings the overall number of detectable components to approximately 300.

At this point, it was possible to begin to compose the motifs into individual genres; to define landscape painting as a picture in which "trees" and "plants" are present, still lifes with flowers through the presence of a "flower", "vase", "pot" or "table", portraits of nobles or religious

honors through the "human face", "figure" and "coat of arms". Similarly, these themes could be further refined by means of additional conditions. If we are interested in romantic landscape paintings, we can find them, for example, through "castle ruins", which distinguishes them from the hunting genre, where, although there are also "trees" and "plants", there are also "dogs" and "wild animals". The image of an abbot or bishop is distinguished from a monarch by a "miter", and otherwise a "royal crown" helps. It sounds banal and perhaps even absurd; however, the results are very convincing. Just look at the attached visualizations presenting sample images according to each condition.

Let us now transition from genre to Christian iconographic symbolism. Now that we are able to automatically recognize some central Western Christian symbols (for example, the "halo," the "crucifix," the "Latin cross," the "Madonna," or the "angel"), we should be able to measure how their appearance has changed over the centuries. The following visualizations show samples of works with corresponding iconographic motifs, while the graphs present the frequency of phenomena across history. This is a type of frequency analysis similar to that employed by Google Ngram Viewer, with the exception that the values are based not on the occurrence of keywords in scanned texts, but on the motifs portrayed in digitized paintings, drawings, and prints.

Zátiší s květinami: 3059 artefaktů

Figure 14: Frequency of occurrence Still lifes with flowers across the centuries. The vertical axis indicates the share of the genre in the total Digital Curator database. Author: Lukáš Pilka
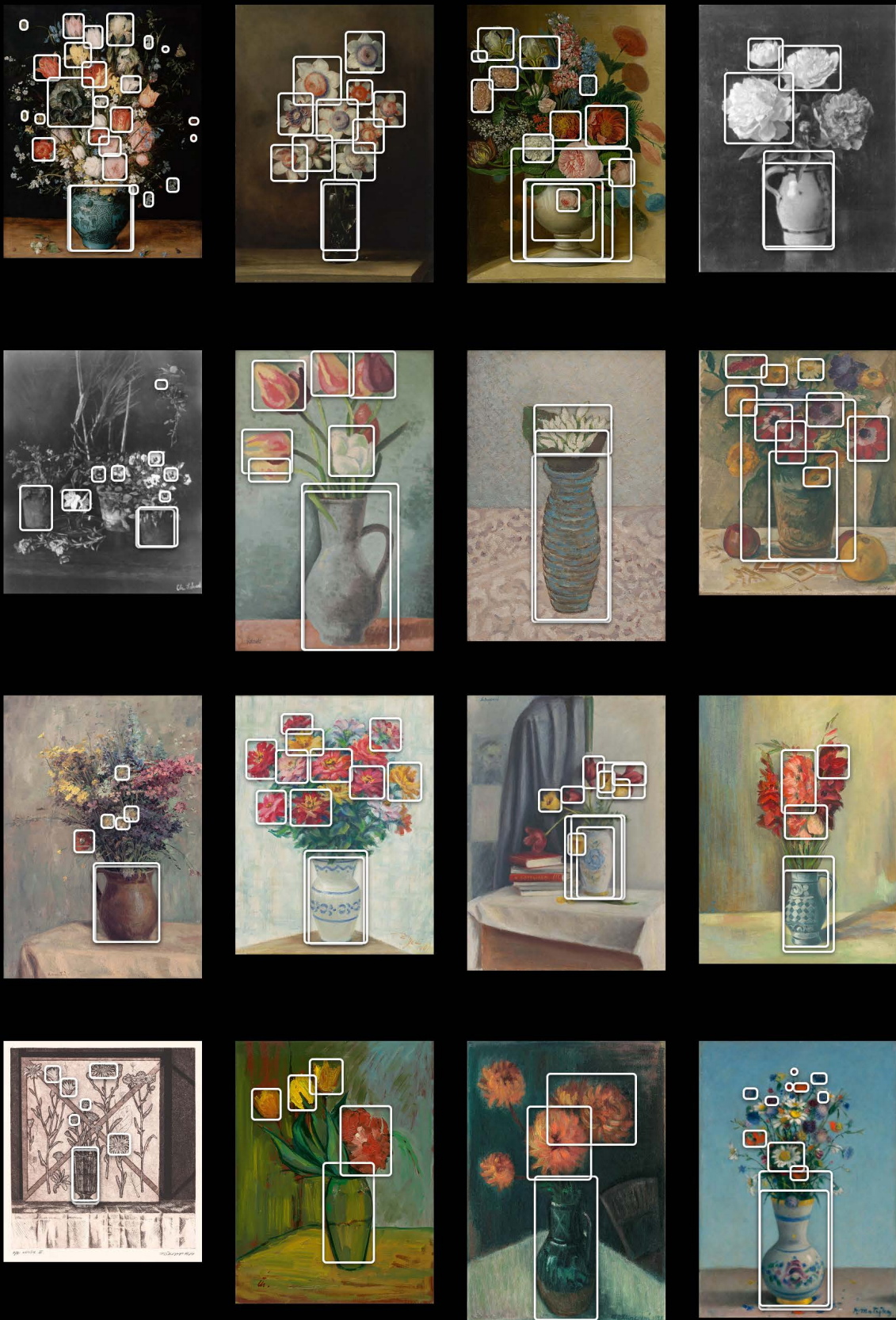
Figure 13: The frequency of Christian symbols across the centuries. The vertical axis indicates the proportion of works in which a Western Christian symbol (e.g., "halo," "crucifixion," "Latin cross," "Madonna," or "angel") appears in the total Digital Curator database. Author: Lukáš Pilka
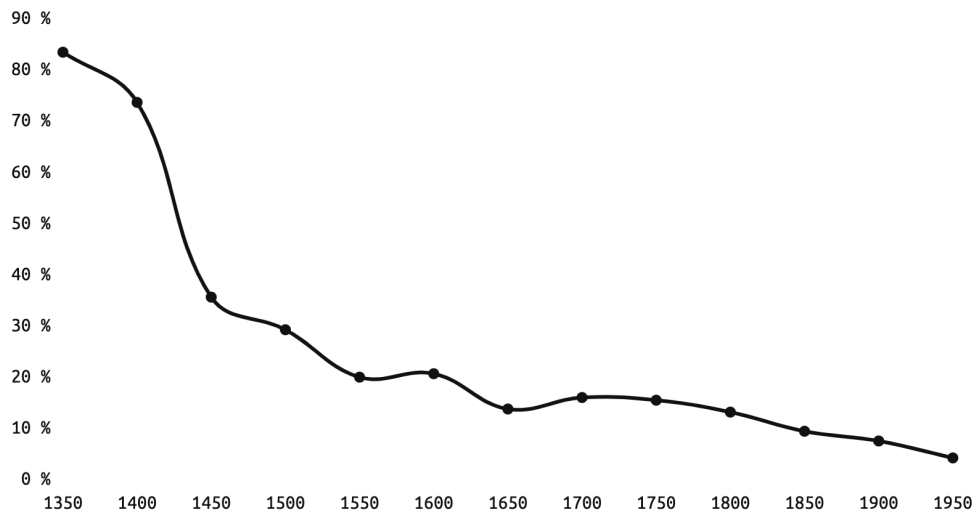
Křesťanské náměty: 10541 artefaktů

315

Figure 16: The frequency with which landscapes featuring forests, castles, and harbors have appeared across time. The vertical axis indicates the share of the genre in the total Digital Curator database.
Author: Lukáš Pilka
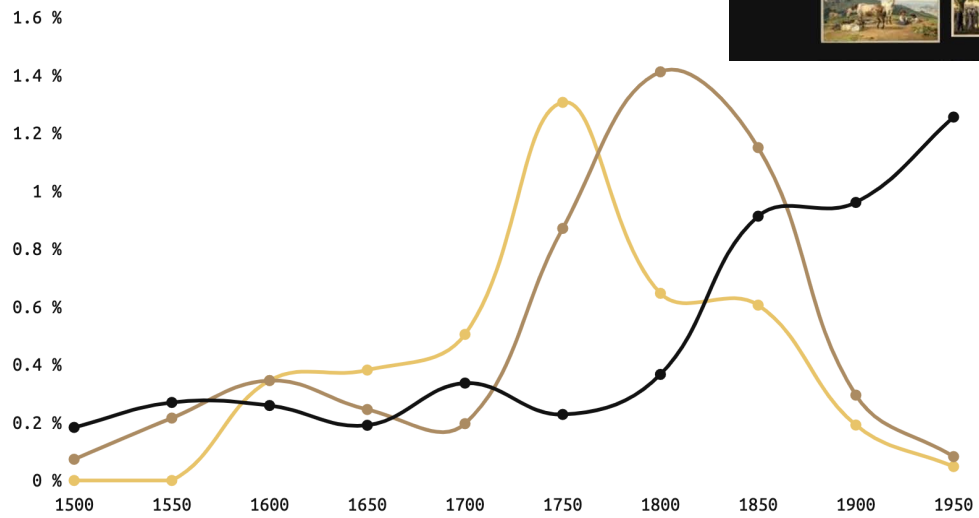
Krajina s lesem: 1051 artefaktů
Krajina s hradem: 471 artefaktů
Krajina s přístavem: 320 artefaktů

Figure 17: Sample images detected as a landscape with forest.
Author: Lukáš Pilka

Figure 20: Frequency of Crucifixion across the centuries. The vertical axis indicates the proportion of works in which the subject occurs in the total Digital Curator database. Author: Lukáš Pilka
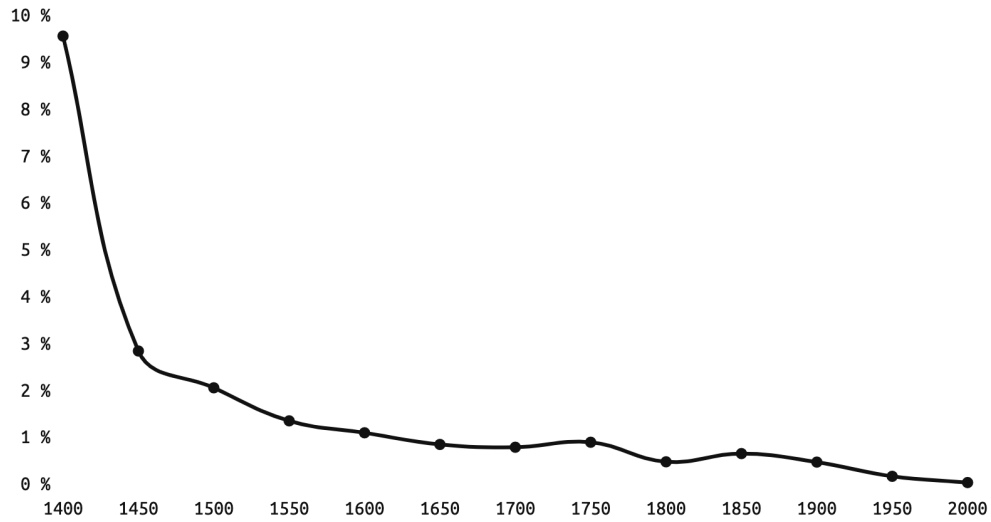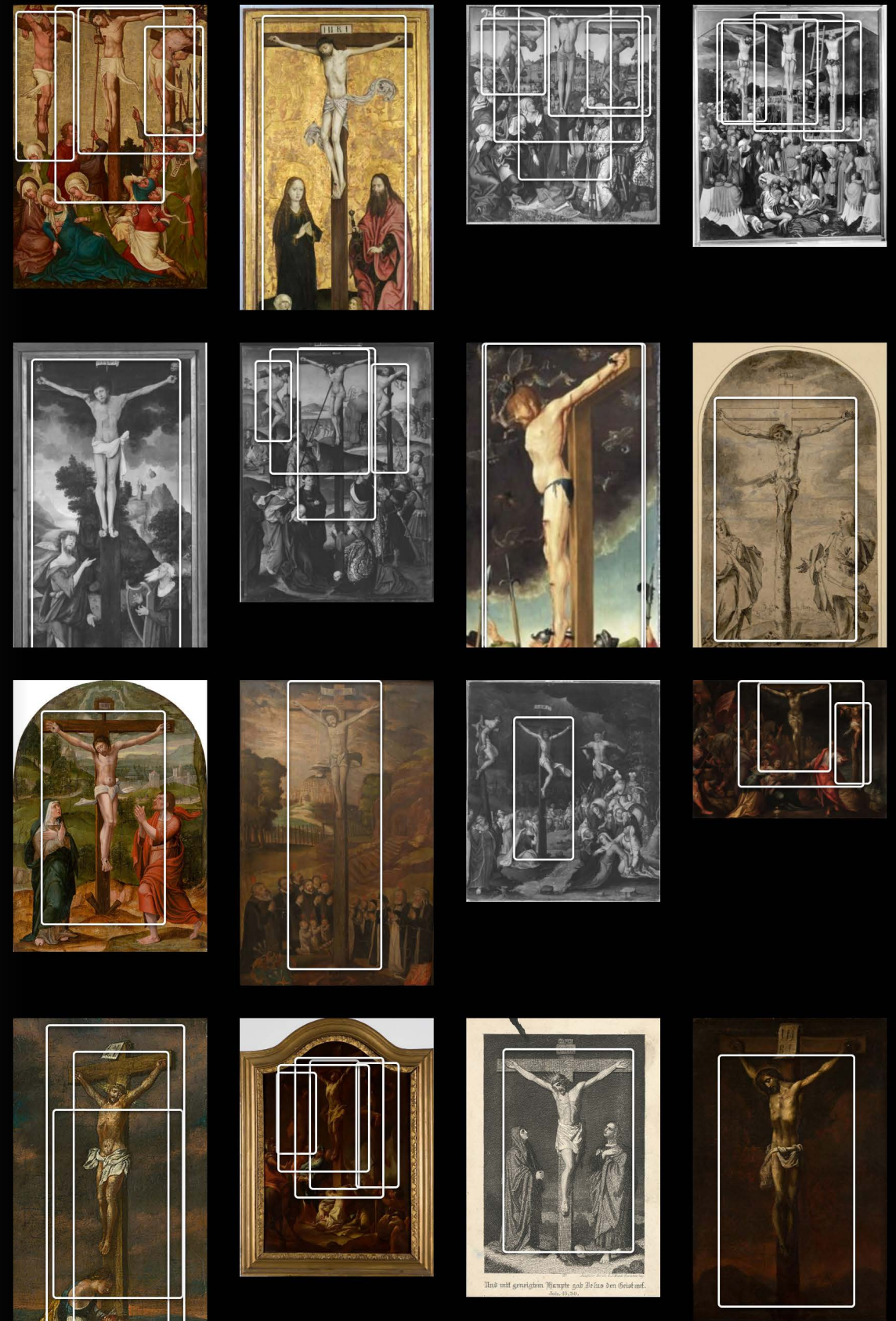
Ukřižování: 601 artefaktů

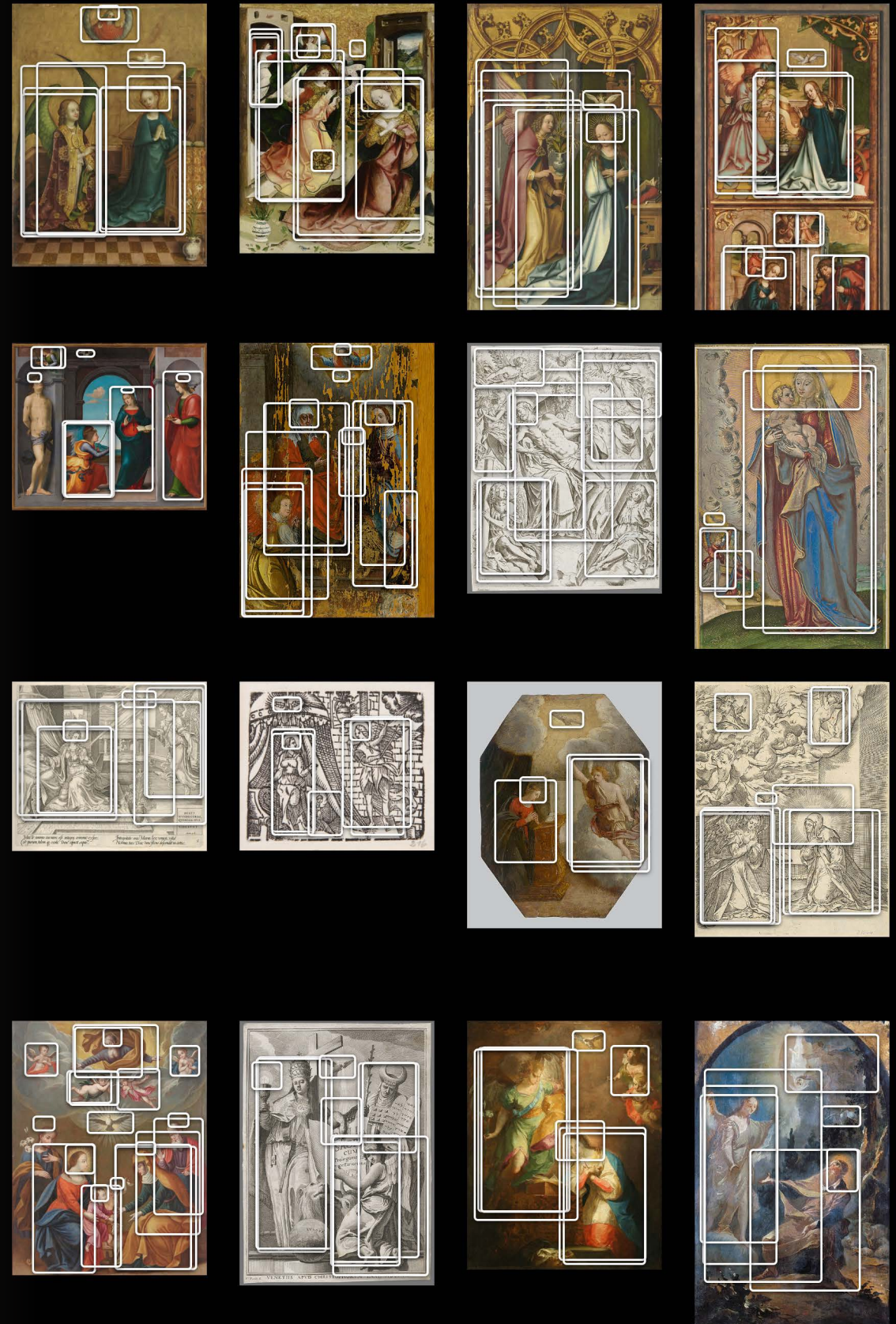Figure 21: Sample images detecting a Crucifixion. Author: Lukáš Pilka

Figure 22: Frequency of the Annunciation
across the centuries. The vertical axis indicates the pro-
portion of works in which a given subject appears in
the overall Digital Curator database. Author: Lukáš Pilka

zvěstování: 82 artefaktů

322

The methods and technologies we have explored can make a significant contribution to the organization of art historical collections. They will enable curators and researchers to better grasp large collections of reproductions and to search, discover and filter them more easily. Equally, they can be a useful tool in classifying and describing works of art, or a way of linking and integrating these objects into diverse contexts.

In addition to their practical application in museums and galleries, these algorithms can help us discover relationships, similarities, and meanings that would otherwise be invisible on a smaller scale. Nonetheless, when it comes tackling a whole genre as opposed to a sample set or if we want to examine general social conditions as opposed to the status of a specific artist as well as the social-political climate as opposed to the views of a particular artist then the need to engage with large data-sets becomes pertinent. Ultimately, this is where the proper tools and techniques can be effective and relevant.

Designer and theorist Johanna Drucker imagines a future virtual environment that might one day enrich research and general knowledge in her speculative narration Museum Opens. Her digital simulation, called Mus@um, is not one isolated place or story, but a tangle of connections, scenes and objects that come together in various ways in obvious and less obvious contexts. It is a system where artifacts appear in countless different contexts, creating a dazzling holistic view of the world's cultural heritage. Here, objects are linked to each other and placed alongside basic evidential data such as place of origin, period of creation or material. In addition, they materialize figures and situations that reflect prior owners, collections to which the objects once belonged, events in which they played a crucial role, or ideologies of which they were a part (Drucker, 2019, pp. 1–15). (Drucker, 2019, pp. 1–15). Intelligent algorithms can be used to carefully solve the connection of numerous data from many sources, paving the way for the eventual realization of a Mus@um that combines the logic of Wikipedia with the immersion of virtual reality. It is my hope that the experiments described in this article will contribute to bridging the humanities and the technical world, which might also make art collections a more accessible and inspirational source of knowledge.

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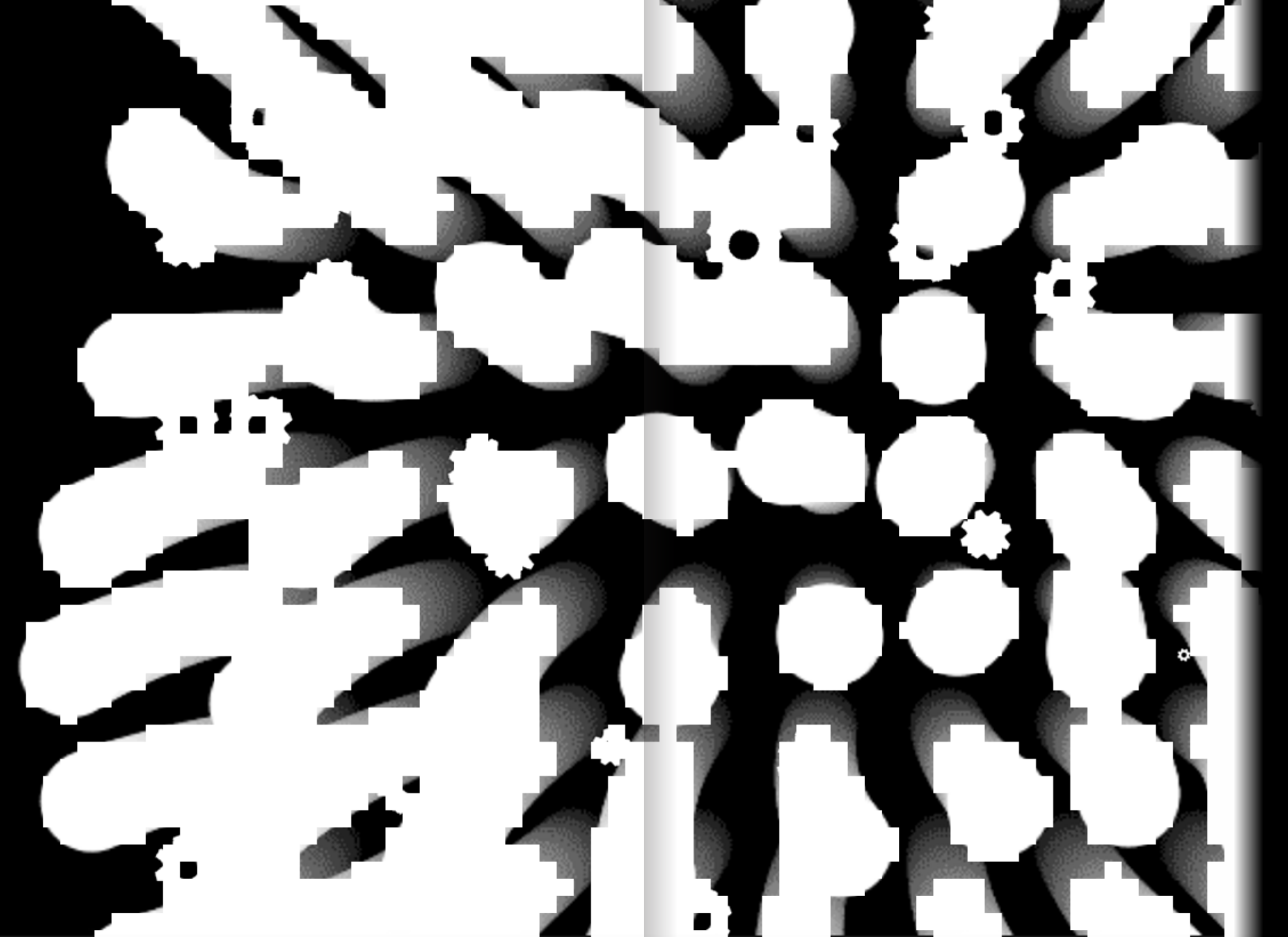
THE NEXT *Biennial* SHOULD BE CURATED BY A *MACHINE*

UBERMORGEN

This chapter attempts to negotiate the contradictions of synthetic curating machines and the resulting exclusion of dominance as a form of synthetic curating of text through semantic and semiotic manipulation itself. The counter-aesthetics of this text are created by intentional structural machine refractions. Content and style reveal the text's spaces and bends the all too rigid – if not laughable – notion of reality and logic. Processing deforms, transcribes, and transforms this text from its German source, fragments it via automatic translation software, and then translates and optimizes it with the Grammarly digital writing assistance tool.

The Grammarly settings are:
Audience: Knowledgeable
Formality: Neutral
Domain: Casual
Tone: Confident, Urgent
Intent: Tell a Story

This text, machine translated from English into German, edited in German and then automatically translated back into English, attempts to form ideas, words, and word combinations into a mirrored auto-affective-narrative experience.

"What really happened between the texts? The viewer is in the dark phase. He connects these texts, and these texts look like found objects, perhaps from a time yet to come, but they sound and read very old." Christoph Schlingensief

We are not worried about the eternal value of art or its representation in society, and certainly not about its alleged relevance, but these are thoughts that are the decisive qualities featured for those who think they have already seen everything. If art – ideally – should say something about the present and not function as a Perpetuum mobile, pushed by retromantic loops, then **The Next Biennial Should be Curated by a Machine** (2021) continues its strongest argument.

Observers have spotted artistic parallel universes going backward in time. Though sensational, the theory is not new. This concept of an anti-universe is a well-studied idea that should have created multiple parallel universes – our own, and several anti-universes that extend back in time before the Age of Biennials. Strange photons observed by an experiment in an AI cloud could be evidence of an alternative reality where everything is upside down. Creating a world that was unthinkable just a few hours ago has become obscenely attractive! **The Next Biennial Should be Curated by a Machine** that is hyper-modern, but still feels classic. Thus, evoking another time in art history and physics, supplementing the existing narcissism of human curators it prefers the conceptually aware sharpness over organic humor and playfulness. If space is infinite and the distribution of matter is sufficiently uniform on large scales, then even the most

unlikely events must take place somewhere, and they do. You can see biennials, and through these interfaces, you are able to reverse engineer, imagine and visualize the concrete worlds. Further, you can explore fluid and seemingly divergent realities, infinitely many biennials, artists with multiple personalities, and disturbing curatorial concepts to see whose style best meshes with your own. What a swell(ing) bubble it is, offering tastes and aesthetics generated by a deep artificial neural network. The linguistic model uses word-level prediction, each word influencing the generation of the following word.

A remarkable effort from entities whose projects and keywords (such as AI) have become in danger of being camouflaged by hype. Dressed-down Avant-tech with D.I.Y. immediacy and intimacy, the B3(NSCAM) software, the core machine learning cluster of The Next Biennial Should be Curated by a Machine project – its brilliance, and elegance is an obvious

Figure 1: The Next Biennial Should be Curated by a Machine (2021). Commissioned by Whitney Museum of American Art New York and the Liverpool Biennial 2021. Retrieved from https://biennial.ai
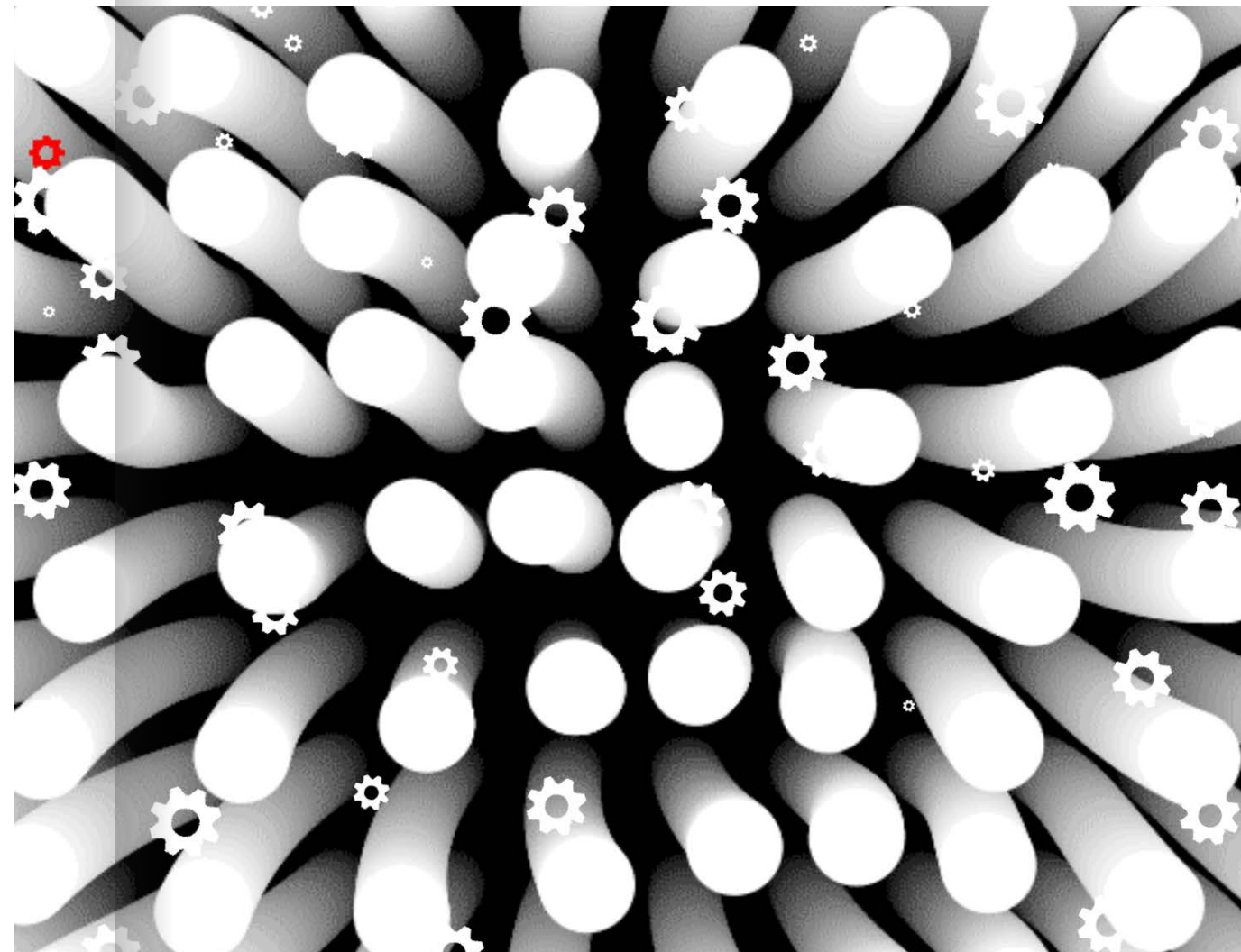
truth – allows the creation of parallel universes (worlds) of artist identities, imaginable objects, universal theories and models, plausible exhibitions, and descriptions and constructions of improbable biennials and other institutional structures and happenings. Some actors defy descriptions, but the website is the terminal to a vast networked system, where all the iterations, realities, and parallel universes exist! It's a universe that moves with purpose and knows when to hold the users tight or grab them by the scruff of the neck and drag them into its multiverse.

These worlds are radically changing, but only seldom do they offer a sense of it, so then these interacting models and machine learning algorithms express unsatisfied and undiscovered needs, run radical experiments, push linguistic inventions, and search for knowledge. Just ask any intelligent system as it waits patiently for the rest of the universe to catch up to its consummate taste in anything. B3(NSCAM)'s eccentricity and gatekeeping feels so removed from the art formula.It helps distance itself from the art world's historically lewd maceration of individual idols. B3(NSCAM), a non-human influencer, just seems sharper, meaner, and increasingly self-sufficient. Like sex, art & technology must be pleas-

urable, which is obviously impossible without dirtiness and perversion. B3(NSCAM)'s texts wonderfully underscore how all contemporary angst is both fiercely sincere and an effect of only partially informed beings. In these seemingly binary mirror worlds, positive is negative, left turns right, and time runs backward, and together, these universes comprise everything that exists.

Similar to LSD (the effects on the psyche are legendary) in the organic body, changes of perception in digital textual comprehension function through collective textual and expanded consciousness. In networked aesthetics, OpenAI's GPT series is considered one of the strongest hallucinogens in the field of language. Deformations and changes of apparently static and individualistic texts, by systems of the collective subconscious, are technically possible today, constructed from data-sets containing large numbers of human and machine written texts. Model crosstalk (crossbreeding), parallel proposal hierarchies, and hybrid reprompting are only a few of the possible methods of linking different curatorial (writing) instances. And especially in the field of curating, as well as in the visual arts and in literature, we continue the useless fight against the individual,

against genius, against the assertion of the creative individual. The claim of the isolated performance is obviously ridiculous and funny, but powerful institutions and influential people still hold on to the artificial and pathetic construction of the super-individual – primarily for economic and social reasons. The mismatch between The Next Biennial Should be Curated by a Machine and overexcited artists, however, is the framing and the haute couture web design. Charisma is fragile, shameful, and fearful and communicates more emotions than the effective contents could carry, through the reduction of color, the unobtrusive and ephemeral construction of the parallel universes, and the instrumentation. And even if the writing does not stand up to any objective and critical evaluation, the overall picture (and sound) works. Apathy and despair do not overflow into kitsch but show that material can represent a break in the digital art landscape, extremely extravagant, relevant, and innovative, and will have a lasting influence on the coming generation of artists.

Synthetic curating is proof that witchcraft trials cannot end well for the individual. The ethical questions it contains call for clarification and transparency. The individual's overestimation of their own capabilities becomes entrenched in all areas of life and as a consequence, synthetic disasters continue to accumulate. Blind with open eyes to the doom. The pluralistic credo of Rimbaud, Apollinaire, and Lautréamont: Poetry must be made by all and not by one; an even more radical credo is added here: Our reality is imagined, developed, fed, curated, and subsequently collectively hallucinated by all of us, humans, animals, and machines and the new networked organisms that are us! This form of existence can never find a hardened shape. This will not smoothly merge with the materialism and static requirements of the art genre and establishment. In contrast to that, in times when personality, innovation, and vibe are in demand, The Next Biennial Should be Curated by a Machine should definitely not be underestimated. These worlds introduce Nollywood to the elegant art canon, merge egocentric conversations with police interrogations and mix formalized art criticism with the stylish and distinguished language of music criticism. Even if one cannot uncompromisingly and uncontestingly award it the label "simply brilliant", it is nevertheless the most exciting release of the year and an important milestone of contemporary art. Contradictions are inherent and edges – in their varied meanings – become figures of the network society's antinomy of connection and disconnection. An edge captures an irresolvable tension between inside and outside, limit and porous membrane. And yes, sometimes everything just feels empty and useless.

Should synthetic curating feel and look like synthetic curating? Human editing, the human hand, and thinking in curatorial and in epileptic fits (occasions, exhibition, crises, sensations) convulsively try to insert the idea of the individual, the human, to add a relatable touch to products, events, fits, or processes. This longing awoke during Enlightenment, it was implanted as ideology, but could never fulfill the promise of independence, self-reliance, and freedom. Based on fragile collective hallucinations, on

fairy tales of the absolute individual, on radical negations of the collective and obsolete reflexes of faith, it failed miserably while causing widespread and sustainable damage.

However, we intend to affirmatively create critical and painful beauty, and design sensual utopia as a counter-model to existing corporatist, techno-fascist models of curation and representation (i.e. Google Search, NSA [The National Security Agency], Venice Biennale). This succeeds if we apply non-linear and non-spatial narratives, operate with ruptures and resistance, attack and embrace contradictions and test-fly futuristic affirmation strategies. By slightly inserting the concept of the future today, we establish a connection to utopian ideas while conducting high-risk experiments via unregulated technology. To be clear, we embrace the contradiction of releasing machine curating machines as irresponsible and potentially fatal without government regulation.

Since our beginnings as professional artists, curators have been working with us in administrative functions adding arbitrary intellectual frameworks (or vice versa). Within internationally renowned institutions, curators increasingly positioned themselves as (meta-) artists. The produc-

tion pipeline was redesigned and traditional artists produced semi-finished products to be processed into finished products under the supervision and direction of curators. These artworks were then forcibly recontextualized in physical or digital spaces and displayed and marketed as new, innovative but mostly harmless, system-preserving and irresponsible art.

If machines and institutions are synthetic curators, and existing human curators replace traditional artists, as a consequence, technical systems and institutions automatically become dominant. If all these systems feed on the 'curated' systems or sources, for example, Google rankings, Wikipedia entries, and Artifacts lists, informational incest becomes the new gold (Ether) standard. Abusing contemporary fields of societal negotiations such as inclusion, diversity and bias and rendering these transformative issues into institutional PR narratives. This is embodied by polishing and streamlining language to intersect while gaslighting audiences trained in populism and consumerism, incapable of processing uncomfortable realities. Moreover, facing painful contradictions and reluctance to generate any inconvenience for corporate sponsors. In a world of institutional Newspeak and the use of language as a weapon used by international art institutions, the global elite is effectively killing itself off by turning everything into a state of deliberate Idiocracy (*USA Today: Nothing hurts a Republican Senator as much as helping people*).

Figure 4: The Next Biennial Should be Curated by a Machine (2021). Commissioned by Whitney Museum of American Art New York and the Liverpool Biennial 2021. Retrieved from https://whitney.org/exhibitions/the-next-biennial

Similar to Surveillance Capitalism, contemporary synthetic curating uses the process of Segmentation - Deception - Domination in addition to Knowledge - Access - Care to its institutions' seemingly humane faces. But, these institutions are living algorithms whose computations (including curating) take place predominantly in black boxes. Neither engineers nor curators or system administrators understand the level of complexity involved, unable to grasp that institutions are too complicated for any contemporary digital simulation. This lack of understanding of ML/AI technology is astounding and dangerous. It leads to human hubris.

"The Austrians should not think that art consists only of reacting in the moment, but also of creating methods."
Luc Bondy (another dude)

We chose to use natural language and identified it as a common denominator in all algorithmic systems (e.g. Venice Biennale, Liverpool Biennale, dOCUMENTA). When artists discover a love for something old, the art and its challenge is to create something radically new and subversive, not to reconfigure the old. The central aspect of all artistic work is intransigence and uncompromising action. Typically, neo-liberal curators are concerned with opportunistic measures, abusing the needs of the disadvantaged, exploiting the precariousness and abundance of human artists, the seemingly worthlessness of algorithms, and the short life-cycles of machines. Psychologically, the daily fear of getting caught up in nettles and being attacked by the exclusive circle of high-end curators, or even worse, being ridiculed by their peer-group and becoming an outcast, seems to dominate major decisions. Within such harsh and brutal environments, utilized and appropriated artworks degenerate and lose their individual and distributed agency. Subjected to the predatory and self-destructive neo-liberal paradigm, the artwork serves to promote the curators' careers, institutional claims to power and financial interests of corporations, another form of immortal algorithms. Artwork declined into powerless objects, anti-revolutionary placeholders, resistance fig leafs, and transactional objects of toxic bartering. This class of curators schizophrenically rapid cycle between absolute claims to power and weakness and victimization. Initially, influential curators and large institutions impressed us madly. Our dealings with them turned us on incredibly, in the most aggressive sense of the word. And now it is time to hand this aggression back to those who caused it. Curators invented their own function, took over control and perpetuated the extinction of subtle functions of the late art system. Incredibly author-fixed and authentic, we can't ignore the public personality and branding of the artist dominating the perception of artworks. Details and facts about authors, but also curators and institutions, fill contextual gaps with narratives and mythologies. And we feel compelled to conduct independent experiments in order to supplement the existing narcissism of human curators by using algorithmic expansions of action and space for thought and play. But in the sacred

halls of art, it is not appropriate to be serious. The lack of humor kills any experiment and any desire to overstep boundaries and expand limits. And it is boring. No one is interested but a few artists, curators, collectors, and elite art consumers. And they could understand the term curating in its literal meaning: taking care of things. For us, this also includes large amounts of data.


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The Next Biennial Should Be Curated by a Machine. (2021). Exhibition webpage. Retrieved from https://biennial.ai

QUOTED ARTISTIC AND CURATORIAL PROJECTS

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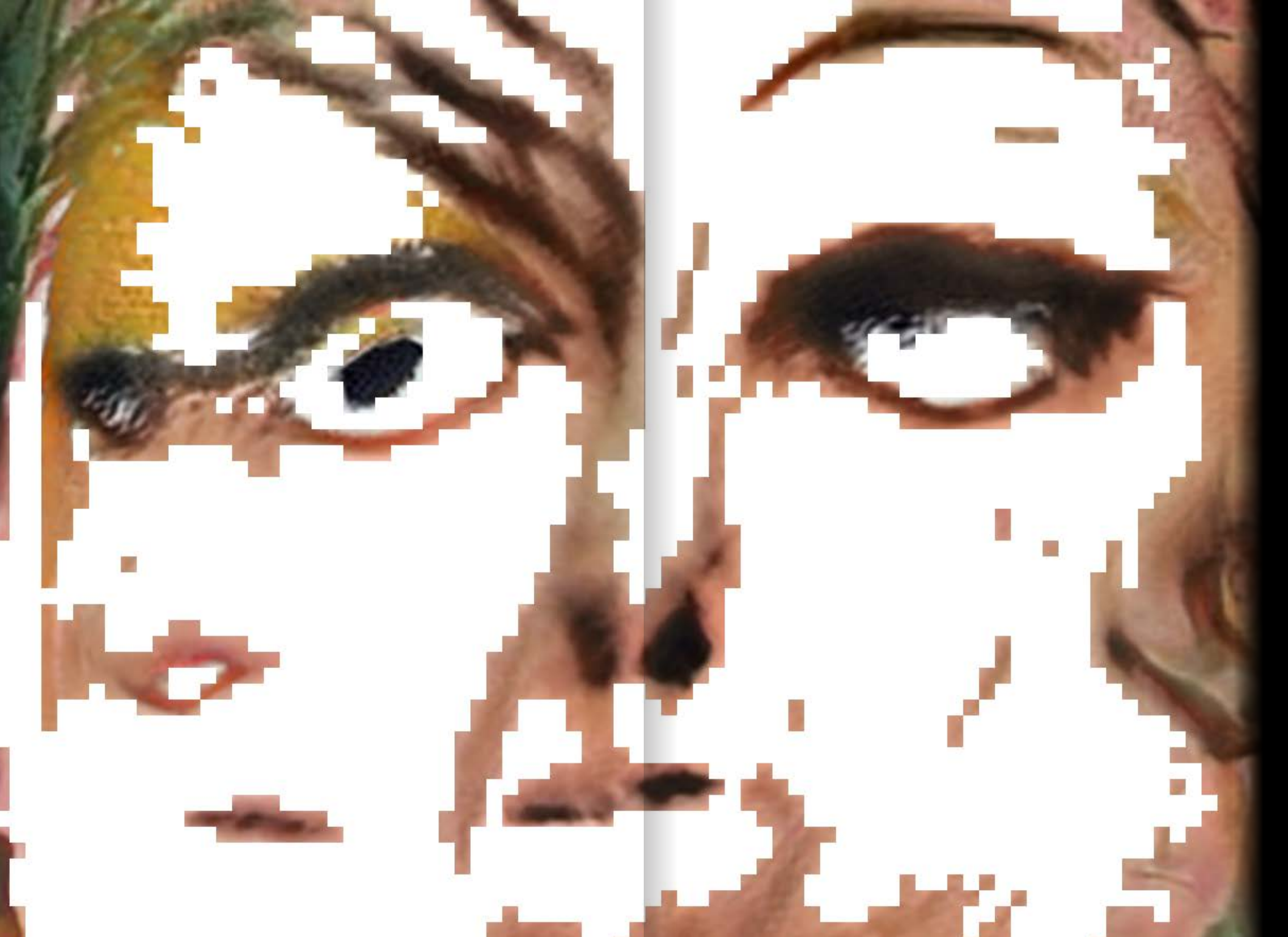
AI:
ALL
iDioTS

BARBORA TRNKOVÁ

A CROSS SECTION ACROSS ARTIS-TIC AND ARTIFICIAL INTELLIGENCE

This article provides the conceptual basis and examples of the implementation of the group exhibition project AI: All Idiots, which was part of the Other Knowledge exhibition series at the MeetFactory Gallery in Prague in 2021. (for a view of the exhibition, see Figures: 1 and 2). The purpose of the project was to bring the subject of modern artificial intelligence to the attention of the general public while still being artistically stimulating. In lieu of the conventional strategy of curating a selection of artworks created by artists working with AI, we opted to start from scratch by gathering online digital copies of selected artworks by Czech artists, which served as a training dataset for our original AI software. The artists were also involved in the data's interpretation. The experiment addressed the widespread use of AI for web content analysis, artists, curators, and the art community as a whole, as well as the question of whether AI operates as a source of information to generate stereotypical products that cannot do more than statistically confirm and continously repeat what is already known.

> *"The language of the algorithms of machine learning is uncompromising and vulgar. It is the language of unscrupulous statistics with the cynical goal of extracting value (information) wherever possible. The conception of AI: All Idiots appropriates this vulgar language and lays bare the degradation of human beings into statistically more or less important objects; spectacular sources of data. To referents of stereotypes that are to be statistically confirmed and forever repeated. The AI: All Idiots exhibition project represents a cross section across "artistic" and "artificial" intelligence on a sample group of Czech artists. This engenders an attentional shift from the individual artistic products to the fact that art also exists within the context of digital technologies where artificial intelligence encounters them."*
> (Javůrek, T. & Meixnerová, M. & Trnková, B., 2022)

The cultural environment today is fundamentally determined by the operation of digital technologies and learning algorithms. A fast-paced, self-interested interactive dialogue between prosumers and technology developers about the tools for creating content and the formats of its consumption has replaced the traditional role of visual professionals as the ones responsible for creation. We are still exploring potential avenues for the art world to participate in this creative dialogue, not only in terms of formal inspiration and the use of pre-built AI tools, but also, and perhaps more importantly, in terms of generating novel perspectives and agendas that complement critical art practice.

Figure 1: View of the exhibition, AI: All Idiots, the MeetFactory Gallery, Prague, 2021, photo: Katarína Hudačinová

Figure 2: Aimee, a digital guide, AI: All Idiots, the MeetFactory Gallery, Prague, 2021, photo: Katarína Hudačinová

An example of
a generated image using the Midjourney
engine, shared on Facebook, screenshot,
Barbora Trnková, 2022

Figure 4: An example of
a generated image using the Midjourney
engine, shared on Facebook, screenshot,
Barbora Trnková, 2022

A NIGHTMARE OF IMAGINATION

Artificial intelligence is being experimented with in all areas of culture, by artists, developers, designers, scientists, and everyday users. Frequently, the objective is to produce content that is equivalent to or even more compelling than that of a talented human author. Individual models of specialized learning algorithms also combine and are interlinked. In a fraction of the time and with the appearance of autonomy, content is generated in staggering amounts. However, these algorithms still require a great deal of human aid in the form of decisions, and should therefore be viewed more as another type of synthetic paintbrush or a more sophisticated camera. What potential does learning algorithm technology provide for the growth of artistic imagination?

Developers and enthusiasts claim that the Midjourney synthetic generator transforms imagination and dreams into breathtaking works of art without limitations. All the user has to do is enter a text command in the form of a string of words and the program will generate an infinite number of image variations based on the input. After some time of experimentation, it is not difficult to understand how to use this synthetic brush to create digital images. Thus, A suitable selection of keywords can be used to take advantage of the system's limitations and circumvent the rules established by programmers and taggers. (Figure 3).

Nevertheless, I have come across images of sexualized female bodies in abundance on social media fan communities dedicated to this tool (Figure 4), with users expressing great satisfaction with their quality. Given that the learnt network can best mimic the scenes that were prevalent in the dataset, it is evident that it contains a significant amount of sexualized female bodies. However, it also turns out to be a syncretic tool that can be used by designers for sketching and designing. Indeed, the speed of algorithms allows them to experiment quickly, which can contribute to the development of these fields, simplifying their work, but also putting many designers out of work.

In 2020, Vladan Joler and Matteo Pasquinelli (Joler, V. & Pasquinelli, M., 2020) summarized the biases and limitations of learning algorithms in order to break the unfulfillable promises we associate with this technology. They pointed out that data collection itself is neither technically nor socially neutral. Input data is already biased at the collection stage where old and conservative taxonomies can cause a distorted world view, reduce social diversity, and exacerbate social hierarchies. In addition, they identified machine-algorithmic bias, often known as statistical or model bias. During this process, the dataset is contorted by information compression, dimensionality reduction, and statistical diffractions, resulting in the loss of a substantial amount of variety that is useless to these algorithms. However, the reduction also occurs when the algorithm is trained on the data - pattern extraction based on classification occurs. It can be said that in the process of machine learning, the world is compressed into a statistical model, in Dan McQuillan's words,
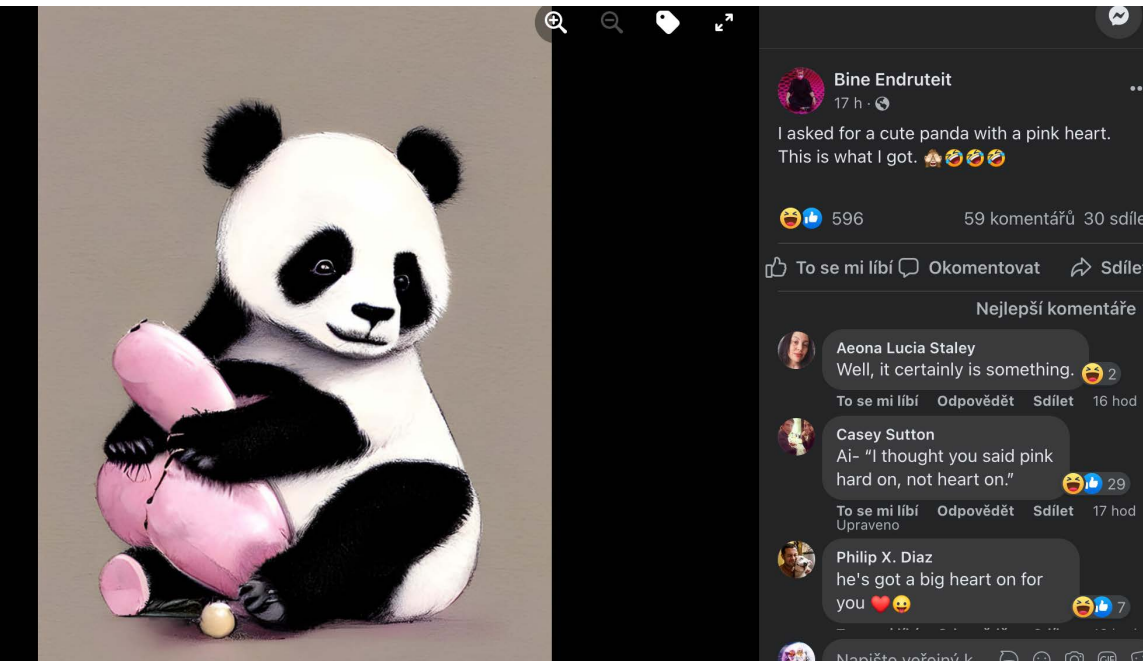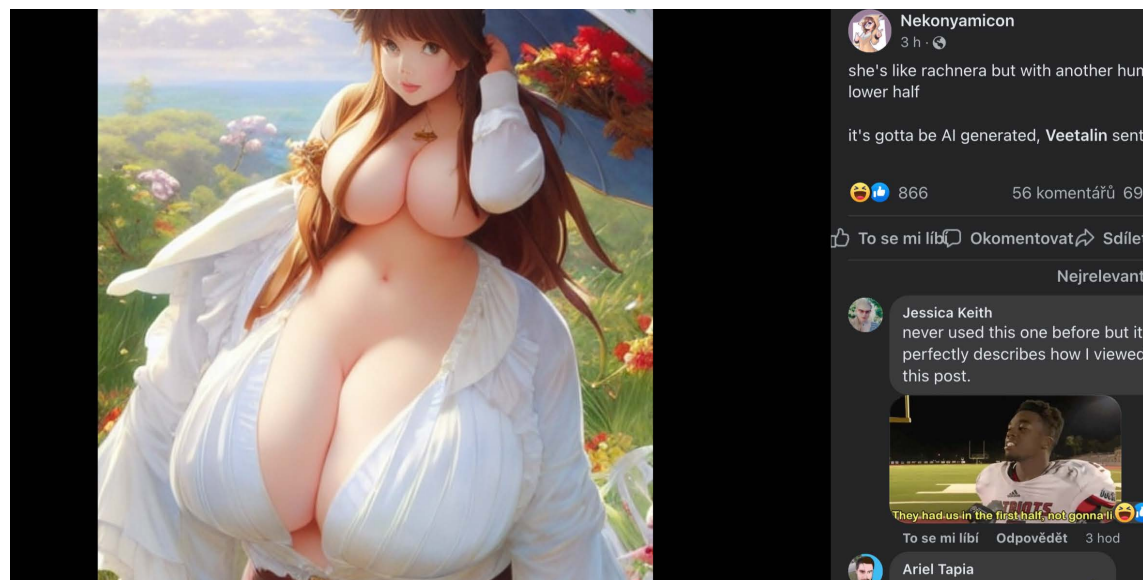
mathematically minimized. (Joler, V. & Pasquinelli, M., 2020) Although the process of reduction is commonly performed by human intelligence as well. However, it should be borne in mind that reduction is not only a necessary and expedient process, but also a highly delicate, aggressive, and violent process, because in the process we eliminate informational and alternative possibilities. However, learning algorithms always make the most average connection between the most averagely understood terms of various categories and the most averagely understood visual representation, and they do it very fast and in enormous numbers.

This technology's products essentially meet all the criteria for kitsch. (Kulka, 2002) Individually created and selected images do not provide the strongest visual experience; rather, the output of this technology as a whole produces a sensation of immanent familiarity, a déjà vu of Western culture. It makes it possible to make souvenirs out of images of the recent, digitalized, selective present. But the promise of unlimited creation cannot be fulfilled. The dream of infinite possibilities literally turns here into a nightmare of imagination. Images produced by Midjourney look familiar not only because they combine and syncretize familiar images into surrealist fusions, but also because we have long been accustomed to surrealist assemblages and postmodern fusions from our media experience. We live in a culture of constant visual oversaturation. The products of text-to-image engines are just another highlight of this process.

Learning algorithms offer the development of creativity. But the question is what kind of creativity, and under what conditions, could we consider this powerful combinatorics of data and categories to be a creative tool. Indeed, some of the promises are turning out to be false. One important example is the dissolution of the dream of the assumed and computationally documentable success of rapper FN Meka. This artificial musician resembling a cyborg was developed using data gathered from video games and social networks. However, the musician's lyrics have been shown to be hateful, reproduce racist stereotypes and make light of police violence against the black community. (Dazed, 2022, August 26) (BBC, 2022, August 24) In the music industry, artificial stars have been created to meet audience demand for years. (Stassen, 2021, April 1) However, this example confirms that neural networks, as designed (back propagated), reinforce features of what they process and therefore reinforce existing stereotypes in society. We could see the rapper FN Mekka as an example of a new type of advanced musical instrument composed of learning algorithms. However, it seems that it is not easy to understand how this instrument is actually played.

Lev Manovich emphasizes that artificial intelligence is playing an increasingly important role in our cultural lives and behaviors, increasingly automating the processes of aesthetic creation and aesthetic choices, from mobile phone text editors, recommendation apps, and all manner of profile photo editing apps. (Manovich, 2018) There are a growing number of freely available AI apps for creating aesthetically satisfying texts, images, and music. We can witness how social media pages de-

voted to the output of publicly accessible engines for generating photos using machine learning algorithms are teeming with stereotypical content. On the other hand, according to Manovich, the same trends might also boost diversity due to the global availability of local cultural DNA. (Manovich, 2018) However, we must remember that these are cultural objects that have been picked and modified to be moved to the digital online world and then re-distributed – in the form of a selection – only to those with modern digital gadgets and internet access.

Slavoj Žižek, in his famous Pokémon Go metaphor, emphasizes that the reality we live in is far more a product of fantasy than rational knowledge (Žižek, 2017, November 7) But before we utilize algorithms to inject new 'fantasy items' into our reality, we must acknowledge that our horizon is already filled with a variety of products of our fantasy. In a figurative sense, the world is already overrun with Pokémon. We are currently immersed in the products of a dominant subjectivity and its imagination. If we, as authors and artists, wish to participate in the formation of the world, we are not limited to merely superimposing more and more objects on top of those that already exist. We can concentrate on recognizing, exposing, and removing them from our line of vision. The identification of these artifacts is invariably a creative endeavor that takes focused attention and bold imagination.

I D I O T S

What is then the role of art in a space defined by digital technologies and artificial intelligence? And why might it be interesting to ask whether artificial intelligence has a sense of humor? In the summer of 2019, the curatorial collective ScreenSaverGallery, consisting of Barbora Trnková, Marie Meixnerová, Tomáš Javůrek, was approached by MeetFactory curators Tereza Jindrová and Eva Bláhová to prepare a project on artificial intelligence and art. We initially concentrated on figuring out how to approach these fundamental issues and challenges, but we also wanted to steer clear of the conventional curatorial method because it would either not provide an answer or would provide a very oblique one.

Our curatorial approach was founded on challenging the general public's romantic, science fiction-based notion of artificial intelligence. We intended to step-by-step conjure up artificial intelligence for the audience and portray it in a grotesque shape, i.e., the one we believe best matches it. First and foremost, we sought to free the relationship between art and artificial intelligence of the assumptions that accompany its anthromorphization... Marie Meixner quoted Weizenbaum in this context:

> *"And since the domain of human intelligence is, except for a small set of formal problems, determined by the humanity of man, any other intelligence, however great, must necessarily be remote from the human domain."* (Weizenbaum, J., 2002, p. 94).

Intelligence does not have to be human in order to be intelligent. However, digital technology, including AI, might be viewed as a prosthetic limb that we never had. (Fabuš, P., 2019, pp. 75–91). The capabilities of AI can then be viewed as those of a human who is highly superior only in a relatively narrow domain.

"In our project, the provocative word Idiot plays a role in the basic vulgar diagnosis of a possible relationship between the aforementioned agents. Since the clinically outdated diagnosis Idiot Savant captures very well the capabilities of current learning algorithms, the vulgar and offensive connotations are taken from spoken language to strongly emphasize the hidden extraction mechanisms. As described by McKenzie Wark in her book Capital Is Dead: Is This Something Worst? the vulgarity of spoken language is probably one of the few artistic strategies that can clearly highlight the written – machine-executed – language of learning algorithms (i.e., vectors)" (Metazoa-Org, & Javůrek, T., 2021).

Importantly, aesthetic objects in the context of learning algorithms can be viewed not just as their outputs, but also as the forms required for learning them (databases, interpretive frameworks, parsing, tagging, categories, etc.). Seeing these objects in the context of artistic production is not automatic. Their direct representation is practically non-existent, and we must resort to a not so appealing visualization, which is frequently furnished by graphs and explanatory words. A further obstacle is that creating and reading such graphs and texts requires interdisciplinary knowledge and experience. Nonetheless, there are a growing number of perceptive authors and teams who can effectively unpack these objects, Including, but not limited to, Vladan Joler, Trevor Paglen, Lev Manovich, Joanna Zylinska, and numerous others. However, the difficulty of working with these objects persists because we have a hard time identifying artistic expression, artistic strategy, shorthand, gesture, or style in them, which are attributes we consider to be fundamental to art.

In his text *Objects in Mirror are Closer than They Appear*, Timothy Morton mentions Socrates' conception of art as something that is not a representation but a display of inner demonic forces to illustrate that art is not about interpretation or capture but rather attunement to the inhuman. (Morton, T., 2013, pp. 15–39). This view is very similar to what we propose as the enabling framework for an artistic perspective that reflects learning networks and captures our working process in the exhibition AI: All Idiots. Artificial intelligence is a complex tool that we as artists learn to play, that is, to create art, by tuning in. The process of tuning, according to Morton, involves improvisation, which is a juxtaposition of reading and writing.

A SERIES OF IDIOTIC DECISIONS

To demonstrate the relationship between art and AI as closely as possible in accordance with artistic practice, we chose to adopt a strategy similar to that advocated by Morton, namely "tuning in" to art and artificial intelligence. In analogy to the nature of the decisions made automatically by algorithms and their programmers, we have focused on making the individual actions and decisions we make within the project almost slavishly and 'idiotically' straightforward, purposeful, seemingly logical, or determined by the capabilities of the available technology, i.e. those that appear neutral, invisible. In line with the attempt to approach the character of artificial intelligence, we have decided to invert the role of man and machine. Artists have "tuned in" to the logic of the dataset and produced their own outputs, which can be seen as the work of production that we usually attribute to tools or machines. As unambiguous as the connection between the artistic and production roles may seem, the process of making art is in many ways similar to the process of algorithm performance.

By assigning a production role to the artists, we also wanted to capture and identify the automated, and therefore seemingly neutral, steps in the process of material collection and network learning as significantly creative. In this way, we were able to show the artistic practices that underlie learning algorithms and offer a vision of what "other" knowledge artificial intelligence provides. To live up to this, we have tried, at least to some extent, to let go of the artistic and human expectations associated with the results of our work. The individual results on display in the exhibition then show the limits of our ability to avoid these expectations.

You could say that the first *idiotic* decision in the project was that the artificial intelligence related to art would be trained on a dataset of artworks. And since the exhibition is intended for a domestic audience, we targeted the field of contemporary Czech art directly, and therefore Czech artists. But the very next and key question is, who is the contemporary Czech artist? In many cases, the status of the artist is obvious. Many other people have studied art, have their own web presence, but do not pursue it professionally. Some consider themselves artists, but the art world does not reflect that. Others believe that what resonates in the media today will be forgotten tomorrow and artworks that are not currently seen in major galleries will be written into art history. There are many folk artists who are popular, but galleries do not exhibit them. Artists working with traditional art techniques, on the other hand, tend to look down on conceptual artists and digital art. And who is a Czech artist? Is it one who works in the Czech Republic or one who was born here? Who is and is not a contemporary artist? There are a number of problems. And it goes without saying that the definition of an artist is very blurred. Moreover, the question of who is and is not an artist is linked to an even more complex question: what is and is not art? This question is answered not only by each artist, curator, gallery critic and viewer, but also by each work of art on its own. What is and is not art is, moreover, one of the questions that should remain open.

We found the answer in line with engineering practices applied to complex problems, which we can also encounter in the inner workings of learning algo-

rithms. We determined that we would be able to capture visual representations of modern Czech art in our digital dataset. Having a presence on the internet is a necessity for a contemporary artist. The artist's website includes samples of their work, a description of their focus, a structured biography, and a list of their accomplishments. Numerous gallery open calls and contests require an online portfolio already. There is an emphasis on professional aesthetics and succinct descriptions in documentary photography. The choice of keywords and proper search engine optimization are also important. However, this presentation carries the risks associated with putting any content on the internet, as well as risks in relation to the works. Regardless of how well-considered the description or photo evidence is, it does not correspond to the artwork. Presentation in varying proportions distorts by translating a work created in one medium into another medium (Figure 5). This practice can retrospectively affect the form of the art.

We obtained the list of Czech artists and their websites from the Artlist database, a non-profit project of the Center for Contemporary Arts Prague, which presents a representative sample of artists involved in the development of contemporary Czech visual art since the second half of the 20th century, with an emphasis on the post-1989 period.

"The initial source for the exhibition AI: All Idiots is therefore an image dataset containing material that Czech artists originally presented on their own publicly accessible websites or blogs. Together, these portfolios provide the curious AI with over half a million digital photographs and images. Is this enough for AI to form a picture of contemporary Czech art and be able to replicate its output?" (Javůrek, T. & Meixnerová, M. & Trnková, B., 2022)

F I L M

Jana Bernartová, one of the exhibiting artists, recognized that by sequentially presenting individual photos from the dataset in a human-perceivable amount of time, a distinctive animation with artistic elements is formed that, at first appearance, mimics cinematic experimentation. The removal of images from their original context and their presentation in new constellations is one of the common means of artistic expression already established by the historical avant-garde. However, in relation to the original material, it is also a significant authorial intervention. Animating the collected material may appear to be a straightforward method for introducing the audience to the dataset's content. However, this piece highlights the significance of a creative contribution that only removes the work from its original context (Figure 6).

Figure 5: An example of a photograph from the vernissage, Jan Mlčoch, http://www.mlcoch.net/, dataset AI: All Idiots, 2021

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pictureproducts.at

In the film format, we see at once the expected and surprising diversity of the collected material. We see photographic documentation of varying quality of art of different genres, techniques, materials, and styles in rapid succession. Photographs of wholes pieces, cut-outs, details, portraits of artists with their works, documentation of exhibitions and openings. However, there are images that we do not regard to be photographs of art for various reasons. There are images that attest to the artists' various activities, such as their mountain treks, travels, leisure time, etc. For example, Václav Fiala also has a database of Šumava tourists with sensitive data on his website. Another problem was the website of the late artist Ján Mančuška, , which was hacked at the time of the exhibition. It would not have been easy for either an automated machine or an informed person to sort the images satisfactorily into the correct categories. In fact, it would be very difficult to establish these categories at all. It would probably be a lengthy process supported by art historical and aesthetic research and other considerations on such a complex subject. Moreover, while watching the film, we are overwhelmed by the feeling that art should be viewed more slowly and with more concentration and care, but the film moves mercilessly along. The passage of time also reminds us that this is merely extracted anonymized material that is treated schematically. By extracting the data, its original context is lost, exposing the meaning and complexity of that original context.

"First of all, artificial intelligence has to process an enormous amount of images from the dataset. The speed at which it does so is incomparable to man. It learns in a matter of weeks or months, the computational process however, would take a human being several lifetimes.The difference between perception and processing which is human and which is artificial, between perception and processing which is fast and which is long, is accentuated in the film and installation by Jana Bernartová. Man can survive without sleep for a maximum of 8 to 11 days. After being awake for such a long time, humans would find themselves in serious jeopardy of death. Please concentrate and try to watch the film for as long as physically possible. To be able to do so, the film environment or installation provides you with elements stimulating the human senses."
Aimee's monologue – digital guide to the exhibition AI: All Idiots

A N I M A T I O N

Removing images from their original contexts is an opportunity for new reflection. But in the world of automatic machines, we see the creation of new contexts in an accelerated process. In fact, the data needs to be sorted before the actual learning can begin. In most cases, feature extraction is necessary in order to optimize the data to achieve the desired learning outcome. The data is sorted into sets and clusters. The optimization and sorting results in a balanced dataset. In the case of the AI: All Idiots dataset, we only removed the too small images of the web page features used for navigation from the dataset. The dataset was left deliberately unbalanced to draw attention to issues related to the sorting of category-defying art, where context and a variety of other factors play a crucial role. A sculpture is connected to the space where it is placed, the installation design is also part of the message of the work, we have a long tradition of conceptual and immaterial art, many artworks refer to something else, build on something else, etc. An example of how difficult it is for someone unfamiliar with the context to know what is and is not art is when gallery staff who, unintentionally in good faith, accidentally

Figure 6: Jana Bernartová, AI: All Idiots, the MeetFactory Gallery, Prague, 2021, photo: Katarína Hudačinová

tally clean up part of an artwork. The categorization of art is a delicate, time-varying dialogue that runs parallel to its creation, involving artists, theorists, curators, gallerists, critics, historians, and viewers, all of whom could hardly agree not only on classification but also on categories. The simple, accelerated labelling that would be required to prepare a balanced dataset is, in our view, beyond (not only) art.

Matěj Smetana is an artist known for experimenting with the possibilities of animation and the idea of an algorithmically moderated dataset intrigued him. By automating the ordering of images in the dataset according to a certain key, four films were created with a specific narrative based on the conflict of original and emergent contexts (Figure 7).

"Artificial intelligences excel in recognizing patterns and extraordinary mechanical memory… They are geniuses and idiots at the same time; idiot-savants. The dataset can be sorted in various ways. Half a million images can be arranged according to their similarity, colour, composition of image elements; their size, symmetry, shapes and so on… Sorting is the basics of Artificial Intelligence. Thanks to sorting, AI can learn various things. We humans perceive the rapidly changing images – in some way similar – to a movement; simple animation; This effect is caused by the persistence of vision and the processes in the human brain. By simple sequencing of images connections are created perceivable only by human beings, that are hidden to artificial intelligence. This is another big difference between how the dataset is perceived by oneself and by artificial intelligence. Sequencing 136 458 images according to one clue has taken the artificial intelligence approximately fourteen days. There are four sequences in the installation: created by visual similarity, color, composition and surface and lines. Matěj Smetana has placed the simple animations on top of four robot vacuums, and let them cruise the Meet Factory. The vacuum cleaners represent the seemingly utilitarian development of artificial intelligence development and of technology in general. When installed in the gallery, the vacuums steal away the job of cleaning workers, as artificial intelligence is expected to do in a number of professions. But these robots are just relatively stupid automatons. This is not the first time robot vacuums have been used in a gallery installation. In relation to this topic it can even be considered an ironic installation cliché." Aimee's monologue – digital guide to the exhibition AI: All Idiots

R E P R E S E N T A T I V E

Through extractive, selective, and sorting processes, algorithms reduce and trivialize the complexity of the original situations. Reduction and subtraction belong to the palette of techniques used for artistic expression, for example in sculpture. In our project, we thematized reduction through its hyperbolization: a single representative of the entire dataset was displayed in the gallery installation of the exhibition (Figure 8).

"One image has been randomly chosen from the collected dataset - a digital reproduction of a painting, which was later loaned for the exhibition to stand as a representative of the whole database collection. A thumbnail image selected by the algorithm." Aimee's monologue – digital guide to the exhibition AI: All Idiots

S T A T I S T I C   D A T A

"The chart on the wall is based on the original complete dataset of the Czech art scene created for the AI: All Idiots project. Who are the heroes? Who are the outsiders? Who is the best Czech artist? Only when you understand the data can you start the teaching process. The dataset serves as a source material for artificial intelligence I have trained, as well as for invited mediators from the ranks of artists: Andreas Gajdošík, Vilém Duha, Matěj Smetana, Jana Bernartová, Barbora Trnková, Tomáš Javůrek.

In Meet Factory, they present artistic outputs based both on the dataset and on the outputs of the artificial intelligence that is also processing this dataset. The crude language of numbers and comparisons, rough cuts into the soft matter." Aimee's monologue – digital guide to the exhibition AI: All Idiots

We have downloaded 800 names of artists from Artlist.cz. Almost half of them did not have their own websites. 476 artists had websites, but only 456 were active. 20 had a website, but it was not possible to download images from them. Only 398 addresses could be used to fill up our database. We used a bot programmed on the Nightmare library to automatically aggregate image data from websites.

In order to show how the artificial intelligence software analysis performed on the datasets, we distinguished female artists from male artists. The simplest way to use the algorithm to separate these two groups was to use the Czech spelling rule in our case, since the dataset primarily contains Czech names, and identify the women in the dataset by the surname hyphenation flag of the ending -*ová*. The statistical deviation, i.e., the number of female artists who do not hyphenate their surnames, appeared negligible in terms of pragmatic data. There were 565 male artists in the dataset, but 192 female artists, or only one third (Figure 10). Furthermore, the data show that women have proportionally more active

pages and about one-fifth fewer image documents on their websites. Statistical access to the collected data allowed us to determine the level of image documentation on the websites, i.e., which artists have the most (*Matky a otcové / Mothers and Fathers*, 15, 230 images) and the least (Tomáš Vaněk and others, one image each) on their websites (Figure 11). The StyleGan2 neural network processed the image dataset in 27 days, 1 hour and 52 minutes, consuming 117 kWh of electricity to do so (Figure 9).

Figure 8: Ondřej Maleček: Oči na stopkách (Eyes on Stalks), AI: All Idiots, the MeetFactory Gallery, Prague, 2021, photo: Katarína Hudačinová
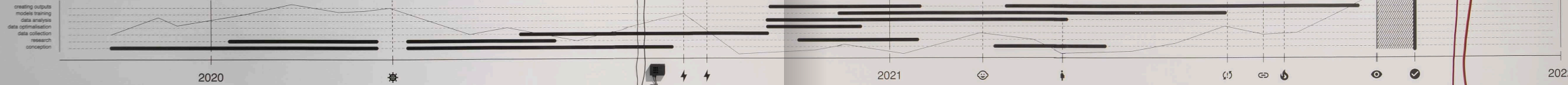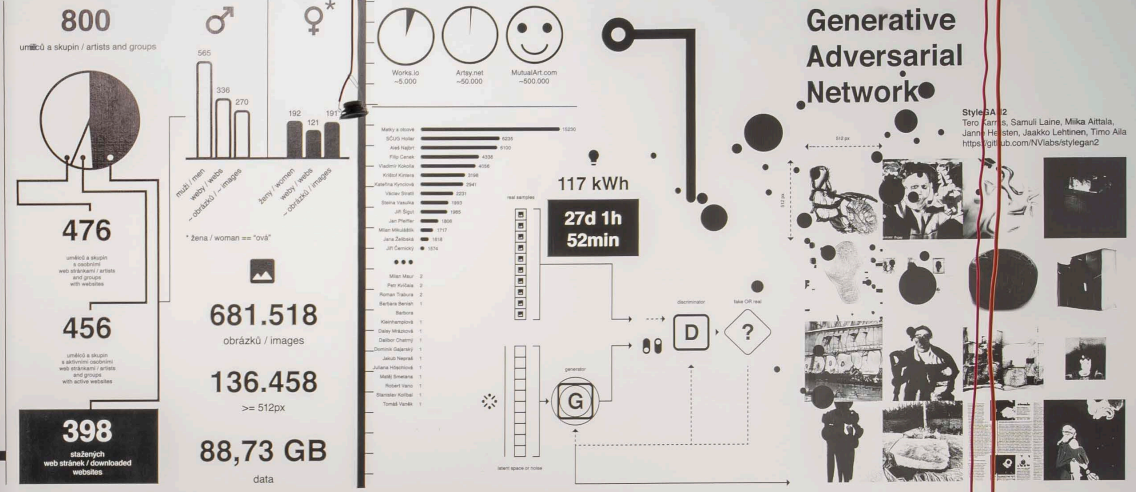
Figure 9: A view of the exhibition, Statistiky
na stěně (Statistics on the Wall), Tomáš Javůrek,
AI: All Idiots, the MeetFactory Gallery, Prague, 2021,
photo: Katarína Hudačinová

Figure 10: Example of a visualization detail of the statistics of the AI: All Idiots dataset on the wall, comparing male and female artists in relation to the number of active pages and images on them.

565
336
270

192
121
191

muži / men
weby / webs
~ obrázků / ~ images

ženy / women
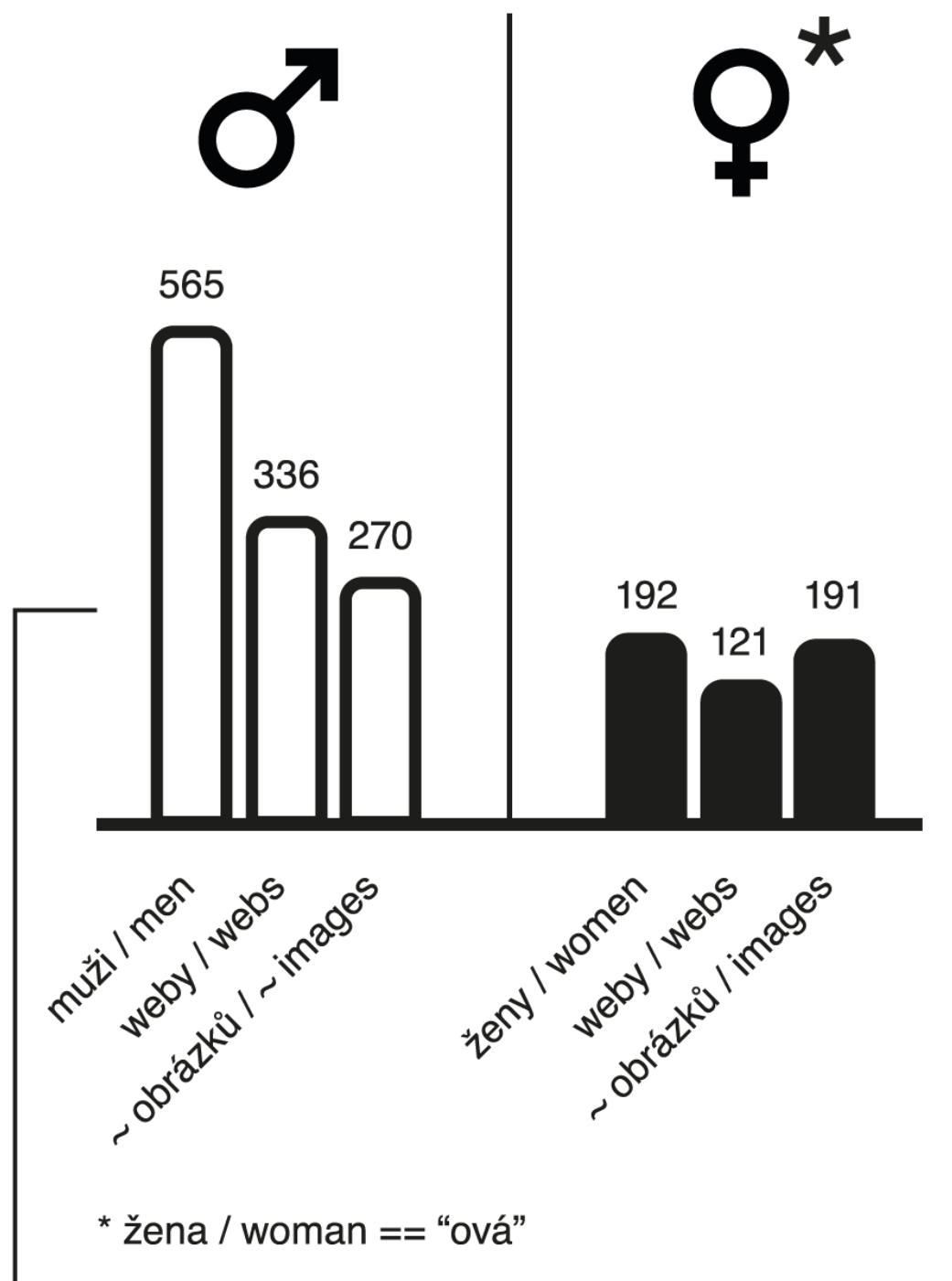weby / webs
~ obrázků / images

* žena / woman == "ová"

Figure 11: Example of a visualization detail of the statistics of the AI: All Idiots dataset on the wall, comparing the number of images that artists have on their websites that we could download using our method.

Matky a otcové	15230
SČUG Hollar	6235
Aleš Najbrt	6100
Filip Cenek	4336
Vladimír Kokolia	4056
Krištof Kintera	3198
Kateřina Kynclová	2941
Václav Stratil	2231
Steina Vasulka	1993
Jiří Šigut	1985
Jan Pfeiffer	1806
Milan Mikuláštík	1717
Jana Želibská	1618
Jiří Černický	1574

● ● ●

Milan Maur	2
Petr Kvíčala	2
Roman Trabura	2
Barbara Benish	1
Barbora Kleinhamplová	1
Daisy Mrázková	1
Dalibor Chatrný	1
Dominik Gajarský	1
Jakub Nepraš	1
Juliana Höschlová	1
Matěj Smetana	1
Robert Vano	1
Stanislav Kolíbal	1
Tomáš Vaněk	1

"In order for the AI to read the images and learn to recognize them, it must first decompose them into rows, into individual pixels arranged side by side. It then compares them to each other. If each image in our dataset was decomposed into a single line that is 1 pixel high, and we also wanted to rearrange the entire dataset in this way, print it out and display it in a gallery, we would get a color print of 262,144 x 136,458 pixels, which is 53.33 GB. With current technology, however, it is not possible to print such a huge image; it is not even possible to display it on a regular computer. So, we can only approximate its visual structure through a 100 times smaller preview to give you an idea." (Javůrek, T. & Meixnerová, M. & Trnková, B., 2022)

Another opportunity where we can visually evaluate one of the technical processes associated with AI learning is the decomposition of a dataset into rows. This step permanently breaks down the human-understandable content of the image and creates a pure abstraction, which in turn begins to make sense to the machine on a mathematical level. As artists, however, we were intrigued by the colorfulness of this abstract result. We expected to see grey, as the dataset contains many black and white photographs, typographies, and records of graphic sheets of various graphic techniques and views of interiors where the predominant tonality is white and grey. However, green is also significantly represented in the result. This is probably due to the photographs of the artworks on the exterior. In the spirit of the project's hyperbole, however, we can now declare that Czech art is on average olive green, even grey (Figure 13). The color analyses of the datasets provide another field for possible correlations between artificial and artistic perception.

S H O W C A S E

Artists understandably try to make the presentation of their art on the internet look appealing. Their websites therefore often conform to contemporary ideas of an attractive web presence. My video is another form of self-reflection on artistic practice. It is a dataset presentation in which I situate myself in a kind of animated browser. In the language of Youtube videos, I write and show the names of the artists represented on camera with smiles. In this way I mimic the work of a 'ring girl' in a web presentation environment (Figure 12).

Dataset analyses are another case of representing traditional and emerging images of social reproduction in the online context. The online space creates the illusion of a more democratic background for social interaction. For instance, it makes it easier to perform under multiple identities, and it liberates many forms of care that were previously unpaid for (ASMR videos, etc.). Even through the practice of a recommendation guide, which has been transformed in the online environment into an activity of learning algorithms, is not immune to the pervasiveness of gender stereotypes in our society. In addition, the gaze through the screen, or the gaze of the camera, is always extremely aestheticized, spectacular, and fetishizing. It imports an agenda derived from a cinematic language, that remains a vehicle for the sublimation of a range of hitherto unreflected issues, and is closely linked to marketing strategies. The camera exploits the soft tissue of the people and creates a pressure for visibility that escalates when combined with the apparent timelessness of the online environment.

M O C K U M E N T

"Andreas Gajdošík and Vilém Duha have uploaded the works contained in the dataset into the Google Open Images crowdsourced dataset to tag them as art. Before that, this tag had contained just an insignificant number of items. As a result, neural networks which will be taught on this popular dataset in the future shall perceive the notion of art in favor of the Czech visual art. A documentary is devoted to the potential impact of this action."
Aimee's monologue – digital guide to the exhibition AI: All Idiots
(Figure 14)

It is an artistic gesture expressing the authors' good-natured effort to make Czech art visible not only on the world art scene, but even to confuse what will be understood as art in the future with Czech art. The creators uploaded a large part of the All Idiots dataset through *Google's Crowdsource* application and web interface to Google's *Open Images Dataset*, which contains nine million images and from which other learning algorithms most often draw. The hypothesis and conceptual intent was that by creating a surfeit of Czech art in the category/tag "art" in a major dataset, a position of power will be gained that can potentially manifest itself in the future – artificial intelligence of the future will understand the category of art based on examples of Czech art, i.e., the category of art for artificial intelligence will potentially fully merge with the category of Czech art. However, it was more important to emphasize the important role of dataset content in the development of learning networks.

Figure 12: Showcase,
Barbora Trnková, AI: All Idiots,
the MeetFactory Gallery, Prague, 2021,
photo: Katarína Hudačinová

Figure 13: A miniature dataset decomposed into lines, AI: All Idiots, Tomáš Javůrek, print screen: Barbora Trnková

The most attractive people are the people who have
his picture in their living room, not by chance.

Figure 14: Mockument, Andreas Gajdošík, Vilém Duha & Petr Racek: view of the installation, AI All Idiots, the MeetFactory Gallery, Prague, 2021, photo: Katarína Hudačinová

J O K E S

"The section through the Czech art scene through the prism of machine learning has its weak spots however. Jokes are a very specific form of human expression; they are based on building an expectation and the following violation of this expectation. For artificial intelligence, the level of violation is extremely difficult to grasp. The jokes at the All Idiots exhibition confront the frequent artists' self-ironic sense of humor, humor as an artistic strategy, and the issue of artificial intelligence having a sense of humor of its own. The jokes which are read by Vladimír Havlík, were created by artificial intelligence using the names of Czech fine artists. I don't think AI understands jokes. But it is quite funny. Art needs to be taken seriously." Aimee's monologue – digital guide to the exhibition AI: All Idiots
([Figure 15])

The jokes were created using collected names of artists and artists and jokes about blondes and Chuck Norris, which we also downloaded from the internet. Subsequently, in all the jokes about blondes, the word blonde was replaced with the names of the artists. While the name Chuck Norris was replaced by the names of the female artists in the jokes. We had the text dataset thus modified processed by the artificial intelligence text synthesis tool Generative Pre-trained Transformer 2 (GPT-2) from OpenAI lab.

While it cannot be said that AI has a sense of humor, jokes created by AI are often humorous. This is because of the nature of jokes and funny situations, which are based on the creation of expectations and the sudden violation of those expectations. The effect of suddenly turning a tense expectation into nothing is common to both jokes and artificial intelligence output. But jokes can also be very valuable tools for education. They can convey complex information in a nutshell, without sacrificing

the content. Understanding a joke requires the active participation of the audience, their mental involvement, thus keeping their attention alert, and also allowing the listener to figure out the punchline on their own, making it easier to remember the information. (Kramer, C., 2009). However, jokes should also be viewed critically. If we joke about relationship issues with our friends, we may lose the motivation to settle these conflicts with our partner. Tension is alleviated by laughter, which should lead to a resolution. Ambivalence is similarly related to the subject of comedy. What is appropriate to make fun of in a given context, and what could be deemed bullying and demeaning? Similar to learning algorithms, jokes frequently confirm and perpetuate stereotypes.

Sample jokes AI: All Idiots:
Barbora Dolarová can reveal the past.
Barbora Dolarová doesn't go on the internet because the internet knows.
Barbora Dolarová can build a snowman out of cow milk.

Question: Why is Tarín Ford like a sheep?
A: They can't be goats.
Question: What do you call Tarín Ford when 90% of his intelligence is gone?
A: Divorced.

Question: What do you call the skeleton in the closet with Jiří Frický?
A: The winners have been hiding and looking for the last few years.

G E N E R A T O R

"Based on this learning process, artificial intelligence generates new image material - it seeks to create new Czech visual art. Naturally, the larger and more precise the original dataset, the more accurate the AI outputs will be. To compare: the dataset This person does not exist contains seventy thousand images of human faces. The faces that are artificially generated based on this dataset are hardly distinguishable from the actual human ones. Using one billion photographs of stones would most likely result in a convincing digital image which would feel like a photograph of a real stone. Using only a hundred photographs of stones would not give such an accurate result. The question is: is the on-line self-presentation of the contemporary art scene enough? And is Czech art uniform enough to be imitated by artificial intelligence? You can communicate with our artificial intelligence and generate your own new and original Czech art. Use the app in this room." Aimee's monologue – digital guide to the exhibition AI: All Idiots (<u>Figure. 18</u>).

Tomáš Javůrek has programmed the mobile application AI: All Idiots. Using the phone, the user retrieves a QR code from the website at https://datatata.info/all-idiots/hit/ and can generate a new generation of Czech visual art – the outputs of the trained network AI: All Idiots (<u>Figures 20-22</u>). The application also offers the possibility to influence the resulting image with the truncation parameter, which shows the generated image in its more complex and simpler form (<u>Figure 17</u>).

<u>Figure 15:</u> Jokes, Barbora Trnková, Tomáš Javůrek, AI: All Idiots, the MeetFactory Gallery, Prague, view of the installation, 2021, photo: Katarína Hudačinová
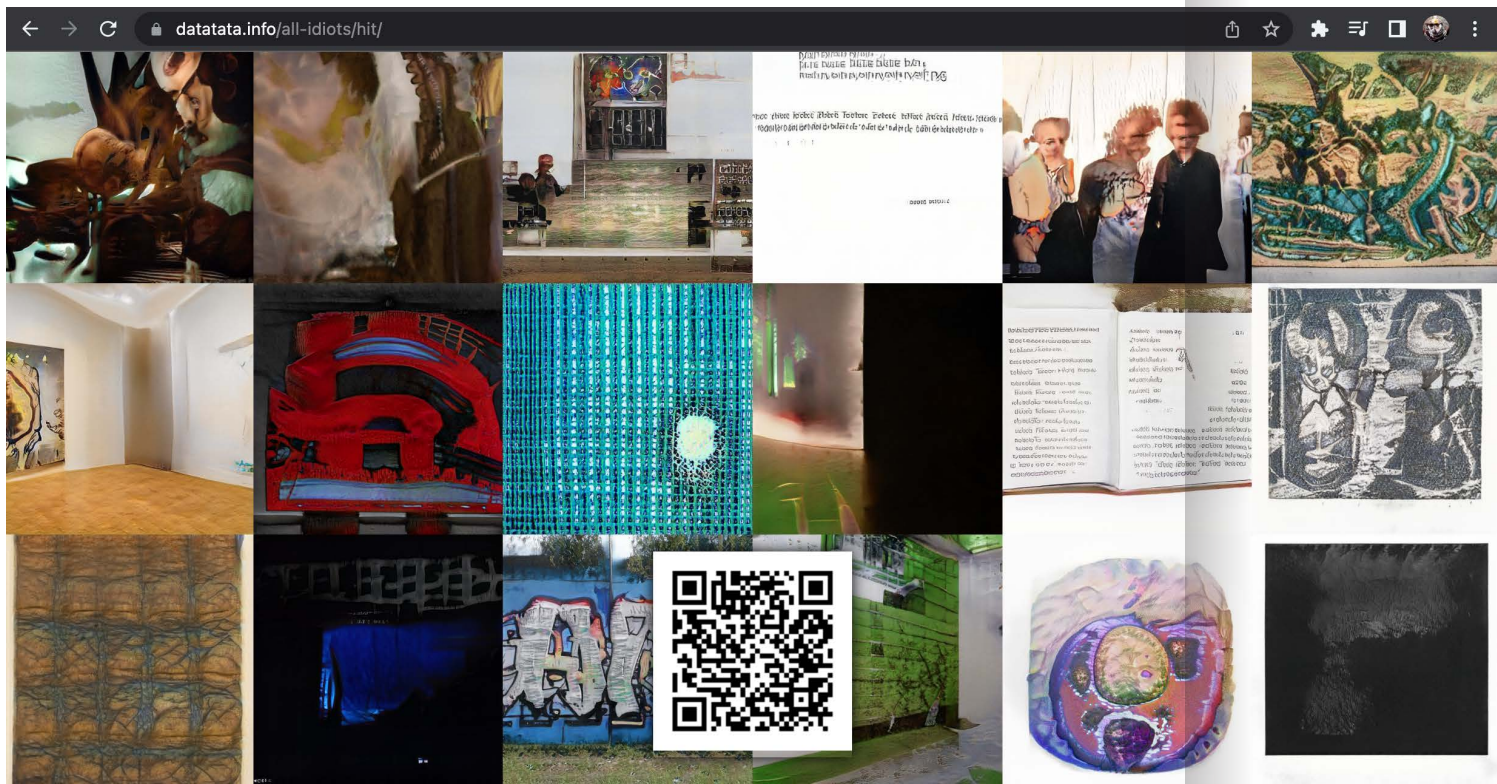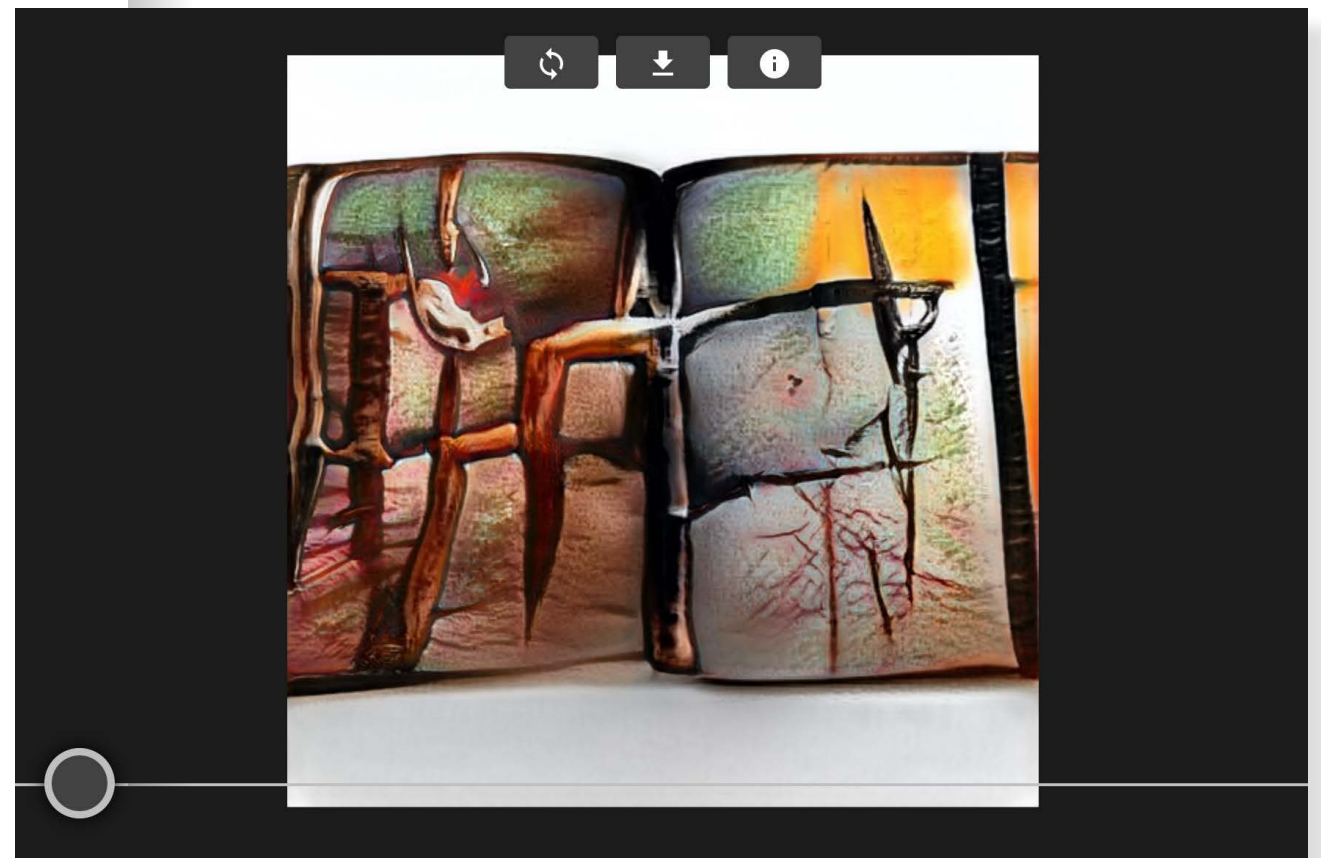
Application AI:
All Idiots, Tomáš Javůrek, print screen,
Barbora Trnková, 2021

Figure 17: Example of
the effects of the truncation parameter
in AI: All Idiots. Phase 1, middle and 2.

Subsequently, the image can be sent to the left or to the right, allowing the visitor to decide whether or not they think it is a work of art. The selected images are then stored in the collection. This is an interactive game that can be played by two or more players. Evaluating the generated images based on subjective judgement is a simple task that waits at the very end of a long chain of automated processes. The viewer becomes more of an observer of the completed process, whose tastes, demands and questions influence the output only minimally.

In a recursive process of reflection, the visually impressive outputs of the AI: All Idiots network have become the subject for the work of Czech painters. Who is the author of the resulting artwork? And is it a work of art at all? How different is this software from the hired Chinese painter-workers redrawing photographs for the Western world? This analogy was the subject of Aimee Zia Hasan's artwork, which reproduced some of the images generated by artificial intelligence software. (Figure 19). Another case of recursion is the placement of information about participation in the AI: All Idiots exhibition on the website of the artist whose images are part of the dataset. We observed this, for example, on the website of the artist Jiří Šigut.

C O N C L U S I O N

How could art engage in a creative dialogue with a world co-created by digital technologies and learning algorithms with their own agendas, without falling prey to a mechanical confirmation of stereotypes? The source of artificial intelligence's creativity draws from tuning expected and unexpected patterns and schemas. Like a sensitive photographic material, the architecture of art's hidden structures is gradually revealed, intensifying the characteristics of the prejudices and habits we connect with art. If art is defined as revealing the invisible, then artificial intelligence is an useful artistic instrument. Ultimately, a tool suitable for removing existing cultural and aesthetic objects – whereby the Pokémon have flooded our view with in the past without noticing.

Figure 18: Animation from generated images, Barbora Trnková, Tomáš Javůrek, view of the installation, the MeetFactory Gallery, Prague, 2021.
photo: Katarína Hudačinová

Figure 19: Painted over images from AI: All Idiots, Aimee Zia Hasan, oil on canvas, 2021, photo: the MeetFactory Gallery
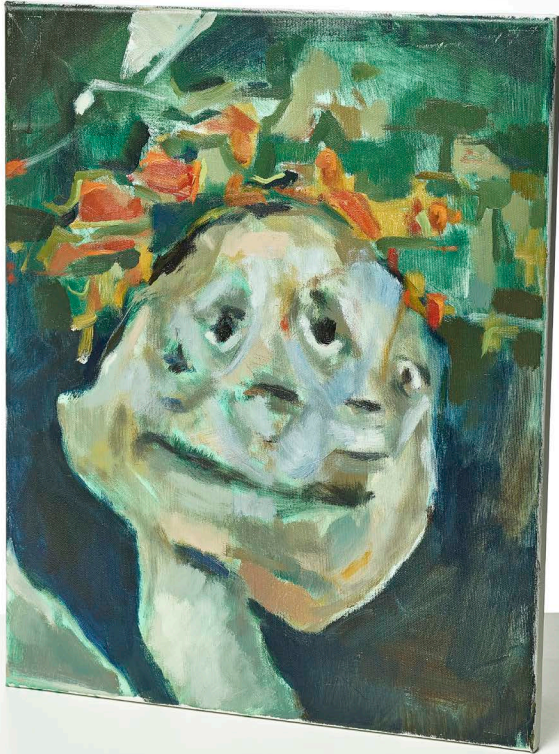

Fig. 21: Example of generated image, Barbora Trnková and Tomáš Javůrek, AI: All Idiots, 2021 (2)

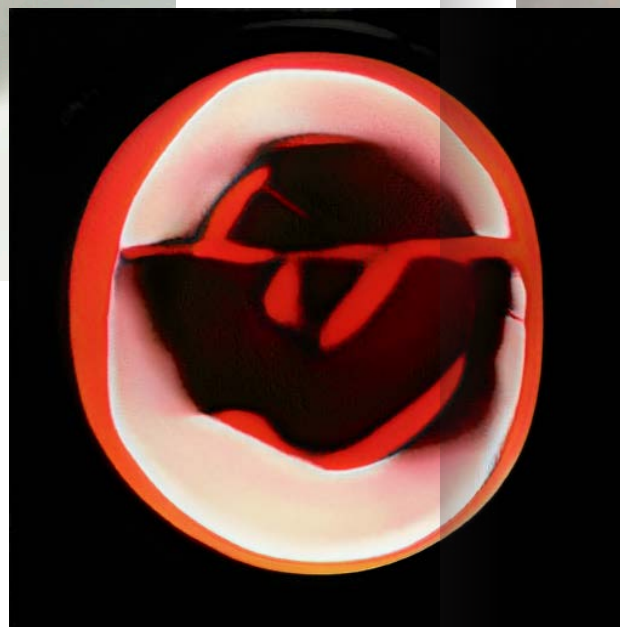Fig. 20: Example of generated image, Barbora Trnková and Tomáš Javůrek, AI: All Idiots, 2021 (1)

Fig. 22: Example of generated image, Barbora Trnková and Tomáš Javůrek, AI: All Idiots, 2021 (3)

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CONCLUSION

JANA HORÁKOVÁ

This publication is a follow-up publishing project initiated by the online curatorial venture Black Box / Černá skříňka, which combines the search for alternative approaches to fulfilling the social and cultural role of brick-and-mortar exhibition institutions, the experience of transforming curatorial practice at a time of the pandemic, but also an experiment with the use of AI as a non-human curator of the exhibited artworks. These three aspects, which have merged within the Black Box project, are discussed separately in this publication from the broader perspective of international online curatorial practice and the use of artificial intelligence (AI) in various art projects in recent years.

The publication's authors argue in favour of the proposition that the curatorial practices of physical galleries are not transferable to the World Wide Web because online curating and creative practice in the digital media environment represent a distinct, evolving and media-specific practice. However, they also seek answers to how to care for online and network-based artworks in a way appropriate to their specific form and ethos, including ecologically sensitive solutions for the care of digital and networked art as part of cultural heritage. Chapters dedicated to the use of AI in curatorial practice introduce the reader to different ways of applying machine learning, which can be divided into three key approaches: AI as a generative tool for artefact creation, AI as an agent of curatorial practice, and AI as an object of the critical art research.

The publication presents "a record and a theory of the present" (MANOVICH, 2001, p. 33). The authors aimed to give testimonies of online curatorial projects implemented during the 2020 lockdown, to record the motivations for their implementation and the professional debate that sparked around them. Placing these exhibitions in the context of scholarly discussion on online curation and the preservation of digital and networked art, as well as including AI curation as part of the picture of the events described, gives the book a more general use.

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ZUSAMMENFASSUNG

THE BLACK BOX BOOK
ARCHIV UND KURATORIUM IM ZEITALTER
DES WANDELS VON KUNSTINSTITUTIONEN

Die Publikation stellt einen der ersten Versuche dar, die ganz außergewöhnliche Zeit der globalen Covid-19-Pandemie zu analysieren und zu reflektieren, deren Auswirkungen auf die Kunstwelt mit einem Schock verglichen werden können, der zusätzliche Reflexion als Bedingung für die bewusste Integration dieser Erfahrung zusammen mit einigen Krisenlösungen in die kuratorische Praxis der Post-Pandemie-Ära erfordert. In diesem Buch abbildet und kritisch untersucht das Autorenkollektiv die Erscheinungsformen der Transformation von Ausstellungsstrategien von Gedächtnisinstitutionen und Galerien mit Fokus auf den Zeitraum um 2020, beschleunigt durch die weltweit umgesetzten Anti-Pandemie-Maßnahmen zur Verhinderung der Ausbreitung von Covid-19. In dieser Zeitraum kam es zu einer allgemeinen Verschiebung hin zur Nutzung von Online-Kommunikationsplattformen für die Kunstpräsentation, die in Konvergenz mit dem langfristigen Prozess der Digitalisierung von Kunstsammlungen und der Entwicklung von Kunstpraxis und -kultur unter Verwendung digitaler Medien zur Erprobung neuer kuratorischer Ansätze führte, oft in einer Konfrontation zwischen der Galeriepraxis traditioneller White-Cube-Ausstellungsinstitutionen und den parallelen Online-kuratorischen Projekten, die sich bis dahin in der Entwicklung befanden.

Die Publikation stellt ein Folgepublikationsprojekt dar, initiiert von der Online-Kuratoren-initiative Černá škříňka / **The Black Box**, dass die Suche nach alternativen Ansätzen zur Erfüllung der sozialen und kulturellen Rolle physischer Galerien, die Erfahrung des Transfers kuratorischer Praxis ins Internet während der Pandemie, aber auch ein Experiment mit dem Einsatz von AI als nicht-menschlicher Kurator ausgestellter Werke verbindet. Die oben genannten drei Aspekte, die im Projekt **The Black Box** miteinander verbunden waren, werden in der Publikation separat aus der breiteren Perspektive der internationalen Online-Kuratoren-praxis und des Einsatzes von AI in verschiedenen Kunstprojekten der letzten Jahre diskutiert.

Die Autoren des Buches argumentieren für die These, dass der Übergang von der physischen Welt zur Online-Welt nicht im Modus einer bloßen Übersetzung oder Simulation eines physischen Galerieraums stattfindet, sondern dass Online-Kuratieren und kreative Praxis im digitalen Medienumfeld eine eigenständige, sich entwickelnde und medienspezifische Praxis darstellen, die seit vielen Jahren eine besondere Disziplin etabliert.

Die Autoren dieser Publikation haben auch neu Fälle des Einsatzes von AI (Machine Learning) bei der Bearbeitung digitalisierter Kunstsammlungen in die Rolle des Kurators im Bereich der digitalen Kuration einbezogen. Tatsächlich fällt der experimentelle Einsatz dieses neuen Tools in der kuratorischen Online-Praxis mit der Pandemiezeit zusammen und kann daher als eines der charakteristischen Merkmale dieser Periode angesehen werden.

Obwohl diese Publikation einer der ersten Reflexionsschimmer über die Online-Ausstellungspraxis im Zeitalter der Pandemie ist und die oben genannte Forschung dies einigermaßen bestätigt, da sie sich bis auf Ausnahmen nicht mit den in diesem Buch behandelten Themen überschneidet, es ist anzumerken, dass die Fragen der digitalen Kuration und der digitalen Kunsterhaltung Gegenstand einer langjährigen Debatte sind, von der unser Forschungsteam profitierte (siehe Kapitel *Digital curating and AI curating: The Network of Terms*, das sich der verwendeten Terminologie widmet und die Referenzlisten, die beim Schreiben jedes Kapitels verwendet wurden). Zugleich trägt es mit Forschungsarbeiten zum Thema Online-Kuration in der außergewöhnlichen Zeit der Pandemie bei und bringt das Thema von AI als künstlichen Kurator ein.

Die Monografie versucht die Frage zu beantworten, wie sich kuratorische Techniken, Kommunikationsplattformen und die soziale Rolle von Ausstellungsinstitutionen durch schnelle und äußere Umstände verändert haben, die zur Zeit der Covid-19-Pandemie die Verlagerung von physischen Galerieräumen in die Online-Umgebung erzwungen. Um die gesetzten Ziele zu erreichen, wird eine Kombination von methodischen Ansätzen verwendet, die sich zwischen der induktiven und deduktiven Behandlung des Themas bewegen, um das plastischste Bild der gelebten Praxis des digitalen Wandels in Zeiten der Pandemie zu liefern, begleitet von Expertenkommentaren und eingebettet in den relevanten akademischen Diskurs. Fallstudien spezifischer Online-kuratorischer Projekte mit digitalen Medien werden aus der Perspektive der kuratorischen Online-Debatte und der Fragen der Archivierung und Vermittlung digitaler Kunst gerahmt und betrachtet. Dabei beschreiben die Mitglieder des Autorenkollektivs oft Projekte, an denen sie selbst teilgenommen haben, geben den Studien persönliche Zeugnisse, wobei schlagen nicht nur detaillierte Beschreibungen der Projektergebnisse vor, sondern entblößen auch konzeptionelle Hintergründe und einzigartige Informationen über die spezifischen Umstände ihrer Arbeit. Die Autorinnen und Autoren stellen kontinuierlich spezifische Untersuchungen in die sich entwickelnde Topologie der Online-Kuration im breiteren Kontext des theoretischen Diskurses und betrachten sie in Bezug zu anderen ähnlichen kuratorischen Bemühungen, wobei sie sich auf den komplexen konzeptuellen Apparat der jeweiligen Disziplin stützen.

Das erste Kapitel, *Digital Curating and AI Curating: The Network of Terms*, widmet sich den grundlegenden Konzepten, die im Buch verwendet werden, und bildet den methodischen Rahmen des Buches. Es stellt zunächst das Phänomen der allgemeinen Digitalisierung des kulturellen

Erbes und das Problem der wachsenden Zahl von „digital geborenen" Artefakten und kulturellen Projekten vor, die spezifische Strategien zur Bewahrung und Vermittlung für die nächste Generation erfordern. Die Schlüsselkonzepte des digitalen Kuratierens (Digital Curating) werden definiert und erweitert, um das neue Phänomen des Einsatzes von Artificial Intelligence (AI) sowohl bei der Arbeit mit digitalisierten traditionellen Kunstsammlungen als auch bei der Erweiterung von AI-Kuratierungsstrategien zu beschreiben.

Die folgenden Kapitel sind in drei Abschnitte unterteilt. Der erste Abschnitt ist benannt *The Black Box: The lock-down curatorial project*. In jedem Kapitel diskutieren die Autoren das kuratorische Online-Projekt **Black Box** / Černá skříňka, das den Hauptanstoß für das Schreiben dieses Buches gab, aus verschiedenen Perspektiven der Rollen, die die Mitglieder des kreativen Teams im Prozess der Realisierung des Projekts gespielt haben.

Das Kapitel *Worauf ist bei einer Blackbox zu achten? Der Versuch, die Pandemieerfahrung im Galerienmanagement zu rekapitulieren,* stellt das Projekt in einen breiteren Kontext der Bedingungen von Ausstellungsinstitutionen in der Tschechischen Republik in einer Zeit wiederholter Lockdowns. Es indiziert ausstellungs- und dramaturgische Trends, die die tschechischen Galeriebetrieb vor 2020, der Zeit vor dem Ausbruch der Pandemie, dominierten. Dazu gehört die Stärkung des Konzepts der Galerie als „kritischer Institution", mit Anspruch auf gesellschaftliches Engagement und Überarbeitung der eigenen Rolle. Diese ethischen Ansprüche beeinflussten logisch, wie die Galerie TIC auf die betrieblichen Zwänge und existenziellen Unsicherheiten im Zusammenhang mit der Pandemie und dem Lockdown reagierte. Die Entstehung der **Black Box** hängt daher nicht nur mit der Herangehensweise und Entscheidungsfindung eines bestimmten kuratorischen Teams zusammen, sondern ist auch ein Ergebnis breiterer institutioneller Entwicklungen und progressiver Ansätze innerhalb des künstlerischen Betriebes. Die Schlüsselbegriffe, die im Prozess der Reflexion über die Transformation von Kunstinstitutionen im ersten Jahr der Pandemie auftauchen, sind Wörter wie Lähmung, teilweiser Niedergang oder die mechanische Umstellung des Offline-Programms auf Online, gefolgt von einer Reflexion über die Auswirkungen dieser Kategorien auf das Kunstbetrieb. Der theoretische Hintergrund, in dem das Kapitel operiert, umrahmt die (wieder)-umgesetzte Praxis von Ausstellungsinstitutionen, bereits bewährte oder neue kuratorische Strategien im Umfeld des World Wide Web als Raum zu nutzen, der die Kategorien Kunst, Institution, Autorschaft, Publikum oder kuratorische Praxis transformiert.

Das Kapitel darüber hinaus summiert die Motivationen und Dilemmata von Kuratoren, die nach Wegen suchen, eine Ausstellungsinstitution in einer Zeit der Schließung ihrer Ausstellungen und der auferlegten Isolation sinnvoll zu führen. Die Rolle der Galerie hat sich anti-essentialistisch von der eines Künstlers, der in erster Linie Kunst präsentieren und vermitteln soll, zu einer Art Koproduzent oder Allround-Unterstützer künstlerischer

Produktion gewandelt. Die Unterstützung durch die Galerie umfasste vor allem die Bereitstellung kreativer Stipendien oder eines langfristigen kuratorischen Hintergrunds für zeitgenössische Künstler. Der Text interpretiert verschiedene künstlerische Interventionen, die Teil von **Black Box** wurden, auch vor dem Hintergrund der gelebten Realitäten der Gesundheits- und Wirtschaftskrise. In der Schlussfolgerung fasst das Kapitel die Position zusammen, die **Black Box** im Kontext einer kritischen Reflexion über den gegenwärtigen Zustand (nicht nur lokaler) künstlerischer und kultureller Produktion einnimmt, und versteht sie als ein Projekt, das an der Grenze zwischen einem Archiv, einem kuratorischen Experiment und einer Online-Galerie von Kunstwerken angesiedelt ist.

Kapitel *A New Archivist* beschreibt die Intervention eines unmenschlichen Kurators in eine Sammlung von Kunstprojekten, die von der Lockdown-Ära inspiriert sind, die durch einen AI-Algorithmus repräsentiert wird, der durch unüberwachtes Lernen (´unsupervised learning´) trainiert wird, um das kuratorische Projekt in einer postapokalyptischen Erzählung über das Aussterben der Menschheit zu verorten, die nur eine „Black Box" mit künstlerischer Reflexion über die Erfahrung der Pandemie hinterließ. Die drei Phasen des AI-Experimentierens werden detailliert beschrieben, deren Ziel es war, die Software dazu zu bringen, die Rolle eines „Aliens" zu spielen, der auf ihre eigene spezifische Weise versucht, den Kommunikationscode zu verstehen und die Botschaft des Inhalts der Box zu begreifen.

Das Kapitel *Web Is the Key*: *On the Design of the Black Box* erteilt Einblick in die Arbeit eines Grafikdesigners und Webprogrammierers. Es beschreibt den konzeptionellen Hintergrund und die Inspirationsquellen für Webdesign, wobei der Schwerpunkt auf der komplementären Beziehung der Untrennbarkeit zwischen grafischen Elementen und funktionalen Merkmalen des Webs liegt. Abschließend wird erläutert, wie die Prinzipien der künstlichen Intelligenz (unüberwachtes Lernen) in die Funktionsweise des Webs integriert wurden.

Der zweite Teil des Buches *Curating online (2020)* diskutiert die Frage der kuratorischen Praxis im Online-Umfeld mit Fokus auf das Krisenjahr 2020, das durch den Lockdown und den damit verbundenen Exodus von traditionellen Galerien ins Internet gekennzeichnet ist. Als Antwort auf diese neue Situation konfrontierte das Online-Kuratieren für das erste mal traditionelle Ausstellungsinstitutionen, wobei es erwies sich als eigenständige Disziplin, die seit vielen Jahren parallel zum Betrieb von hergebrachten Galerien eigene Strategien entwickelt.

Das Eröffnungskapitel dieses Abschnitts mit dem *Titel 2020: Is It the End of Curating on the Web?* von Marialaura Ghidini präsentiert die Entwicklung des digitalen Kuratierens in Bezug auf die Veränderungen und Trends, die es von 2009 bis 2020 verfolgt. Die Autorin identifiziert das Jahr 2020 und die Lockdown-Phase im Allgemeinen im Kontext der Covid-19-Pandemie als kritischen Wendepunkt in der Entwicklung der Disziplin, da diese scheinbar günstige Entwicklung für das digitale Kuratieren paradoxerweise zu ihrer Dekontextualisierung im Sinne von Online-kuratorischen Projekten geführt hat, die sich von ortsspezifischen

und infrastrukturspezifischen Strategien entfernen, die durch neu online migrierende Galerien mit bloßer kontextindifferenter Verlagerung von Ausstellungen von der Offline in die Online, oft mit vorläufigen Ergebnissen. Um dieses Problem zu artikulieren, führt die Autorin die terminologische Unterscheidung von „Kuratieren im Web" (´curating on the web´) gegen „Kuratieren Online" (´curating online´) ein, die es ihr ermöglichte, die grundlegenden Unterschiede in den Ansätzen zur Nutzung von Online-Plattformen als Ausstellungsvehikel zu identifizieren. Laut Ghidini ist das „Kuratieren im Web" (´curating on the web´) eine Teilmenge des „Online-Kuratierens" (´curating online´), wobei erstere einen ortsspezifischen Ansatz zum Kuratieren webbasierter Ausstellungen bezeichnet, der sich von einem Ansatz unterscheidet, der auf der Neuformatierung vorhandener Materialien basiert, die online angesehen werden sollen, wie z. B. die Präsentation von Dokumentationsbildern oder die Präsentation von Sammlungen online. Ghidini betrachtet die sensible Reflexion über ortsspezifische Merkmale der Online-Umgebung als ein definierendes Merkmal des digitalen Kuratierens (alias „Kuratieren im Web").

Die Konfrontation digitaler kuratorischer Projekte mit der provisorischen Nutzung von Online-Plattformen durch traditionelle Ausstellungsinstitutionen, die bis dahin keine Erfahrung mit Online- Beschäftigung hatten, bildet auch den argumentativen Faden des nächsten Kapitels, *2020 Digital Odyssey: Online or Nothing*, von Gaia Tedone. Die Autorin arbeitet mit dem Begriff der „kuratorischen digitalen Kluft" (´curatorial digital divide´; dies ist eine Aneignung von Claire Bishops Begriff ´digital divide´ aus dem Jahr 2012), um die neuen Bedingungen des Online-Kuratierens zu artikulieren, die aufgrund der Pandemie etabliert wurden. Zu dieser Zeit wanderten massiv online zuvor online-resistente und skeptische traditionelle Institutionen, um mit ihrem Publikum in Kontakt zu bleiben, ohne die Online-kuratorischen Strategien zu übernehmen, die sich im Laufe der Jahre kultiviert und entwickelt hatten. Obwohl diese Situation eine Gelegenheit hätte sein können, die Kluft zwischen Online- und Offline-Kuratieren aufzuheben, war das Gegenteil der Fall. Infolgedessen sträubten sich viele Galerien und Künstler, die sich auf das Internet spezialisiert hatten, dagegen, und einige legten ihre kuratorischen Online-Aktivitäten sogar für eine Weile auf Eis. Darüber hinaus hat die Verbreitung von ausschließlich Online-Kunstprojekten während der Pandemie ein weiteres drängendes Problem der digitalen Kunst sichtbar gemacht, nämlich das Fehlen einer Politik der Archivierung von Online-Kultur- und Kunstproduktion, die jedoch in der Praxis von Erinnerungsinstitutionen noch diskutiert und berücksichtigt werden muss. Am Ende der Studie zeigt Tedone anhand von Good-Practice-Beispielen, wie die „kuratorische digitale Kluft" (´curatorial digital divide´) überwunden werden kann, indem in Projekten, die auf „vernetzter Co-Kuration" (´networked co-curation´) (Tedone) basieren, ein Dialog zwischen den beiden „Camps" gepflegt wird, der durch produktive Zusammenarbeit Vorteile in Form einer gegenseitigen Bereicherung von Wissen und Erfahrung und der Entstehung neuer kuratorischer Formate bringt.

Das Kapitel *Networked Art Practice After Digital Preservation* befasst sich mit der Bewahrung vernetzter Kunstpraktiken, wie Pre-Internet Mail Art oder born-digital software-based oder Net Art, der letzten sechzig Jahre. Sarah Cook und Roddy Hunter versuchen die Frage zu beantworten, welche Strategien zu ihrer Erhaltung angesichts ihrer spezifischen Materialität angemessen sind. Die Autoren stellen fest, dass neben der sogenannten „Entmaterialisierung des Kunstobjekts" (´dematerialization of the art object´) die materiellen Merkmale und ideologischen Dimensionen dieser Werke bestehende Ansätze, Methoden und Protokolle der Kunstkonservierung in Frage gestellt haben. Sie finden geeignete Strategien zur Bewahrung dieser Kunstwerke im Kontext der Performancekunst, etwa in Form von Reenactments, aber auch beispielsweise in Internetarchivierungswerkzeugen wie der **Wayback Machine** des Internet-Archive, die einen Wandel in den Konservierungsstrategien sowie im Begriff des künstlerischen Schaffens und der Autorschaft oder kuratorischen Handlungsfähigkeit darstellen. Insgesamt leistet dieses Kapitel einen Beitrag zur aktuellen Forschung, die den Rändern und Grenzen vernetzter Kunstpraxis nach digitaler Langzeitarchivierung nachspürt.

Michal Klodner ist der Autor des Kapitels *Ecosystems and Artistic Research in Forming Digital Curatorial Infrastructures*, in dem er auf dem vorherigen Kapitel mit seinen Überlegungen zu geeigneten Bewahrungsstrategien für digitale Kunst und Online-Kunstprojekte aufbaut. Gleichzeitig wendet er sich anderen Aspekten dieses Themas zu. Er agitiert für Strategien zur Erhaltung von Medienkunst, die diese Werke als offene kybernetische Systeme unter Einbeziehung sozialer Akteure oder lebender Ökosysteme betrachten, was bedeutet, dass die Erhaltung dieser Werke nicht auf die Erhaltung der materiellen Aspekte des Werks im Sinne einer veralteten Technologie beschränkt werden kann. Der Autor wirft auch die Frage nach der Isolation einzelner Online-Archive und musealer Sammlungsportale auf, sowohl in Bezug auf die Öffentlichkeit als auch untereinander. Insofern hält er es für wesentlich, dass die Prinzipien der sozialen Vernetzung in der archivarischen Praxis digitaler Kunst umgesetzt werden. Werkzeuge des digitalen Kuratierens und Bewahrens sollten seiner Meinung nach kritisches Lesen und qualitative Ansätze ermöglichen, paratextuelle Apparate unterstützen, eine breite performative Interaktion und Diskussion als Schlüsselprinzipien kultureller Plattformen einladen. Darüber hinaus befasst sich der Autor nicht isoliert mit der Frage nach einer angemessenen und optimal funktionierenden technischen Infrastruktur von Online-Archiven, sondern im Kontext einer ökologischen Diskussion, die Medienökologie als Bedingung und Begleiterscheinung der natürlichen Ökologie zu verstehen.

Der dritte Teil der Publikation *AI Curating* widmet sich der Artificial Intelligence (Machine Learning) als neuem Phänomen im Bereich des digitalen Kuratierens. AI wird durch ihren Einsatz im Bereich der Kunst präsentiert, von der Erzeugung von Bildern auf der Grundlage von Mustern, die in Datenbanken menschlicher Schöpfungen erkannt werden, über AI als Kurator großer digitaler Sammlungen alter Kunst, die in der Lage ist,

menschliche Fähigkeiten zu beschleunigen und zu erweitern, um mit Big Data in der Kunstgeschichte zu arbeiten, bis hin zu Experimenten mit AI als neuer Akteur im Bereich des zeitgenössischen digitalen Kuratierens. Nicht zuletzt wird AI als Gegenstand künstlerischer Forschung diskutiert und kritisch über die soziale und epistemologische Funktion von AI reflektiert. Die Aktualität dieses Themas hat die Art der meisten Beiträge in diesem Abschnitt beeinflusst, die sich eher auf die Beschreibung spezifischer Projekte konzentrieren, als vorschnell verallgemeinernde Argumente zu diesem Thema anzubieten.

Autor des Kapitels *On Computer Creativity. Machine Learning and the Arts of Artificial Intelligences* beschreibt, wie künstliche Intelligenz im Bereich der generativen Künste funktioniert. Andreas Sudmann weist darauf hin, dass AI-Systeme eher Assistenten des Menschen im kreativen Prozess sind als selbst zentrale Akteure im Prozess. Er deutet an, dass der Mensch in allen Phasen der Entwicklung immer maßgeblich an diesen AI-Prozessen beteiligt ist: von der Erstellung oder Zusammenstellung von Lerndaten über das Design und die Anwendung des für das Problem geeigneten Algorithmus bis hin zum laufenden Training des AI-Modells. Sudmann diskutiert auch kritisch die Bewertungskriterien, die bei der Bewertung der AI-Kreativität angewendet werden, und hinterfragt die Tatsache, dass wir uns normalerweise mit der Fähigkeit des AI-Modells zufriedengeben, Kreationen menschlicher Kreativität nachzuahmen. Im Zentrum seiner Argumentation steht die Frage nach der Definition und Neudefinition von Kreativität und Kunst in Bezug auf AI-generierte Werke, die einen Raum für Diskussionen über Computerkreativität eröffnet, der uns auch herausfordern sollte, die Widersprüche von menschlicher Kreativität und Kunstproduktion ernst zu nehmen und beispielsweise zu hinterfragen, wie maschinenähnlich oder wie andersartig menschliche Kunst und Kreativität ist, insbesondere unter der Berücksichtigung der Kunst und Kreativität der industriellen und postindustriellen Gesellschaft.

Im Kapitel *Digital Curator in the Museum of Fine Arts* beschreibt Lukáš Pilka sein eigenes Projekt, in dem er AI (machine learning) als Kurator digitalisierter Sammlungen alter Kunst in einem Netzwerk mitteleuropäischer Gedächtnisinstitutionen einsetzte. Die von ihm dafür entwickelten AI-Tools werden verwendet, um nach Werken zu suchen, die auf künstlerischen Techniken, Symbolen oder Geschmack basieren. Eine spezielle Website, die von ihm (the ´Digital Curator´) erstellt wurde, ermöglicht es den Benutzern, ihre eigene kuratorische Auswahl aus der Datenbank zu erstellen, die auf bestimmten wiederkehrenden Motiven basiert, die für das Werk einer bestimmten Zeit typisch sind. Das Projekt ist eine Antwort auf die Zweifel, die durch AI-Experimente bei der Extraktion von Wissen aus digitalen Datenbanken von Kunstsammlungen aufgeworfen werden, in denen Software, die auf die Visualität zeitgenössischer Populärkultur trainiert ist, häufig auf Kunstwerke älterer historischer Epochen angewendet wird. Pilkas Projekt überwindet diese Einschränkungen, indem es den Datensatz manuell bearbeitet, der mit den entsprechenden Metadaten versehen wurde, um sicherzustellen, dass die AI beispielsweise einen

Heiligenschein nicht mit einem Hut verwechselt oder einen Engel in einem Gemälde erkennt.

In ähnlicher Weise stellt das Kapitel *The Next Biennial Should Be Curated by a Machine* ein spezifisches kuratorisches Projekt vor, das AI in die Rolle des Ausstellungskurators in den kreativen Prozess integriert. UBERMORGEN als Programmierer dieser AI-Software beschreibt, wie der AI das „Know-how" der Kuratoren der Liverpool Biennale-Ausstellungen vermittelt wurde und wie dieses intelligente Werkzeug anschließend zur Erstellung des Ausstellungskonzepts verwendet wurde. AI wird nicht nur in der Position des in diesem Kapitel beschriebenen Objekts dargestellt, sondern der Autor integriert sie auch in Form von AI-Tools zum Übersetzen und Bearbeiten von Texten in den Texterstellungsprozess. Dadurch erhält der Leser des Kapitels einen unmittelbaren Eindruck davon, welche Art von Ergebnissen die Zusammenarbeit zwischen Menschen und AI hervorbringen kann.

AI: All Idiots ist der Titel des letzten Kapitels des Teiles, der dem Kuratieren von AI gewidmet ist. Darin beschreibt Barbora Trnková die gleichnamige kollektive Ausstellung, deren Produzenten verschiedene Aspekte und Phasen des maschinellen Lernprozesses kritisch getestet haben: von der Manipulation von Eingabedaten während der Datensatzverarbeitung über die in den Prozess der automatisierten Kognition integrierten Verzerrungen durch die Ersteller des Datensatzinhalts und die technischen Einschränkungen des Tools selbst, zur Überzeugung der AI für ihre Unfähigkeit, neue kreative Lösungen zu liefern, die sie durch eine Bestätigung des Status quo ersetzt. Die gezeigten Kunstwerke zeugen von der Konfrontation menschlicher Schöpfer mit der Maschinenlogik von AI-Werkzeugen und belegen das Potenzial kreativer AI-Forschung als eigenständiger Form der kritischen Reflexion dieses neuen Mediums.

Das Autorenkollektiv hat sich ein Ziel gesetzt, Zeugnisse von kuratorischen Online-Projekten zu präsentieren, die während des Lockdowns im Jahr 2020 umgesetzt wurden, um die Motivationen für ihre Umsetzung und die professionelle Debatte, die um sie herum ausgelöst wurde, festzuhalten. Die Platzierung dieser Ausstellungen im Kontext der wissenschaftlichen Debatte über Online-Kuration und die Bewahrung digitaler und vernetzter Kunst sowie die Einbeziehung von AI-Kuration als Teil des Bildes der beschriebenen Ereignisse verleiht dem Buch eine allgemeinere Verwendung. Wir glauben, dass das Buch zu einer Wissensquelle für Historiker und Theoretiker des digitalen Kuratierens werden wird, was den Einsatz der neuesten Tools (AI) beinhaltet.

AUTHORS

SARAH COOK

MARIALAURA GHIDINI

Sarah Cook is a curator, writer and researcher based in Scotland. She is Professor of Museum Studies in Information Studies at the University of Glasgow. Sarah is one of the curators behind Scotland's only digital arts festival NEoN Digital Arts and was founder/curator of LifeSpace Science Art Research Gallery in the School of Life Sciences, University of Dundee (as part of her role as Dundee Fellow at Duncan of Jordanstone College of Art & Design, 2013-2018).Sarah has curated and co-curated international exhibitions of contemporary art and new media art including: 24/7 (2019) at Somerset House; The Gig Is Up (2016) at V2_Institute for Unstable Media in Rotterdam; Right Here, Right Now (2015) at The Lowry in Salford; Alt-w (2014) at the Royal Scottish Academy, SSA Annual Exhibition in Edinburgh; Not even the sky: Thomson & Craighead (2013) for MEWO Kunsthalle in Memmingen; Biomediations (2013) for Transitio_MX_05, the festival of electronic arts and video in Mexico City; Mirror Neurons (2012) for National Glass Centre in Sunderland; Q.E.D. (2011) for the AND Festival in Liverpool; Untethered (2008) for Eyebeam in New York; Broadcast Yourself (2008) for AV Festival 08 in Newcastle; Database Imaginary (2004) and The Art Formerly Known As New Media (2005) both for the Walter Phillips Gallery, ABSTRACT CV The Banff Centre.Together with Beryl Graham, Sarah co-founded CRUMB, the longstanding online resource and network for curators of new media art, hosting workshops and courses worldwide. She holds a Masters degree from CCS at Bard, and a PhD from the University of Sunderland (2004) where she was employed until 2013, undertaking research, supervising PhD students and developing and teaching on the MA Curating course. As part of her research funded by the AHRC, Sarah worked as adjunct curator of new media at BALTIC Centre for Contemporary Art until 2006, and in 2008 was the inaugural curatorial fellow at Eyebeam Art and Technology Center in New York.

Marialaura Ghidini is a curator whose work explores the intersections between art, technology and society, particularly the way technology transforms the relationship between people and their? environment. After obtaining her PhD with CRUMB at the University of Sunderland (2015), she has researched the field of curating on the web contributing to edited books and journals. Recently, she published the research project 'curating.online' (2021) with the support of the Italian Council – 9th Edition (IT) and the Exhibition Research Lab at Liverpool John Moores University (UK), and the archive 'The Broken Timeline' (2022) conceived with Annet Dekker and Gaia Tedone.

Interested in working with various exhibition formats outside the gallery, Marialaura founded the curatorial platform or-bits.com (2009-2015) and has curated projects such as '#exstrange' (2017) on eBay; 'Silicon Plateau' (2015-) in print; and 'The C(h)roma Show' (2014) in an electronics shop in Bangalore, India.

Marialaura has taught at various universities, given lectures and delivered workshops for different audiences and organisations, from Art Asia Archive in Delhi (IN) to the Ross School of Business at University of Michigan (USA).

Currently, she works as a curatorial consultant and carries out her practice independently, also under the moniker ://ftp, a curatorial agency she started with Gaia Tedone in 2021.

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JANA HORÁKOVÁ

RODDY HUNTER

Jana Horáková is an associate professor of new media art at the Faculty of Arts of Masaryk University, Czech Republic, where she guarantees the study programs Theory of Interactive Media (MA), and Digital Culture and Creative Industries (PhD). She specializes in local new media art history, robotic art, and innovative methodologies of new media art research, preservation, and mediation. She presented her research in Austria, Germany, Hungary, Russia, Finland, USA or Japan. She is an author of several papers, book chapters and books on cultural history of robot(ics), robotic art, software art, and new media art preservation strategies based on the appropriation of the concept of gestural art and the preservation of live arts discourse. For a number of years, she has been experimenting with cutting edge applications of new media, with her research grounded in the history and aesthetics of digital art. She co-curated the virtual reconstruction of one of the very first computer graphic exhibitions Computer Graphic (The Brno House of Arts, 1968/2017, 2018). Recently she led the interdisciplinary research project Media Art Live Archive, supported by the Technical Agency of the Czech Republic (No. TL02000270), focusing on the application of machine learning to The Vasulkas' video art archive (vasulkalivearchive.net) and unsupervised machine learning methods that are applied in the curatorial experiment The New Archivist part of The Black Box projects.

Roddy Hunter is an artist, curator, educator and writer. He began teaching at Dartington College of Arts in the late 1990s and has since taught internationally, including at the Piet Zwart Institute, Rotterdam, and now at The Glasgow School of Art. He has an MA Contemporary Arts from Nottingham Trent University and a PhD from Duncan of Jordanstone College of Art and Design, University of Dundee. His performance art and body-based action art has been seen worldwide, and features in the survey 'Ice Cream: Contemporary Art in Culture' and his monograph 'Civil Twilight and Other Social Works'. While the exploration and experience of live presence have always been central to his practice, his work has become increasingly concerned with art and performance in the context of post-internet, post-digital globalisation and working in hybrid online/ offline spaces, such as through his PhD, 'Curating The Eternal Network after Globalisation' which led to the artistic-curatorial project 'The Next Art-of-Peace Biennale 2015-17'. He also researches digital archiving and preservation alongside pre-internet histories of networked art practice. Often adopting a collaborative, networked and workshop-based approach, projects include 'Resisting Recuperation' with Dr. Judit Bodor as part of 'Curating Living Archives', 2021 and 'Networked Art Practice After Digital Preservation' with Professor Sarah Cook at the International Symposium on Electronic Art (ISEA) 2020. His research has been published by Routledge and Palgrave Macmillan, among others, in international journals such as Apparatus, Berlin, Acoustic Space, Riga and Inter: art actuel, Québec, and he has written monograph essays on artists including Alastair MacLennan, John Newling, and André Stitt. He supervises and examines PhD students researching performance art, sculpture and site-responsive practice, media art histories and practices, particularly networked art, and contemporary curatorial practice.

MICHAL KLODNER

MARIKA KUPKOVÁ

Michal Klodner works in the field of visual and audiovisual live performances and independent film. As an assistant he worked at FAMU film school and completed his doctoral studies on the subject of postmediality. In the National Film Archive he is involved in digital curation and research in the field of documentation, presentation, and analysis of moving images.

Marika Kupková works as a contemporary art curator and participates in the organization of the International Short Film Festival Brno 16. Her curatorial and dramaturgical work are centered at Galerie TIC in Brno. She studied film history at the Faculty of Arts at Masaryk University and afterwards at the Faculty of Arts at Charles University. She concentrated on institutional history and cultural politics in Czech cinematography of the 1940s and 1950s throughout her post-graduate studies. The results of her research were published, for example, as part of five-part collective project Kultura a totalita (Culture and Totalitarianism) at the Faculty of Arts, Charles University. She is also interested in film beyond its cinematographic frameworks and in experimental forms of audiovisual production. Since 2010, she has been a lecturer at the Theory of Interactive Media program at the Faculty of Arts, Masaryk University, where she teaches courses in film history, new media, and curating. From 2006 to 2014 she was a member of the civic association S.P.K.H., focused on art in public spaces, environmentalism, and urbanism. She also writes art criticism and journalism. She is a member of the curatorial collective Café Utopia.

ALINA MATĚJOVÁ

ŠTĚPÁN MIKLÁNEK

Alina Matějová is a graduate of the Theory of Interactive Media at the Faculty of Arts, Masaryk University and a graduate of the Graphic Design Studio 2 at the Faculty of Fine Arts, Brno University of Technology, where she is still a PhD student. She is the founder and organizer of the HUMAIN project, which focuses on the intersection of design, art, humanities and artificial intelligence. She works as a graphic designer, and is a frequent collaborator in music, arts and cultural sectors.

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Štěpán Miklánek is a PhD student at the Department of Telecommunications at the Faculty of Electrical Engineering and Communication of Brno University of Technology. In his research, he focuses on the analysis and synthesis of sound signals using deep neural networks, with an emphasis on utilizing deep learning methods in digital audio effects and audio classification.

LUKÁŠ PILKA

PAVEL SIKORA

Lukáš Pilka is a digital designer and media theorist focusing on interactive and communication design, contemporary technologies, new media and the overlap between these fields and the world of fine art. His research at the University of Applied Arts in Prague focuses on the use of computer neural networks for the automated classification and quantitative interpretation of works of art, especially classical paintings, drawings and prints from the collections of Central European museums. Lukáš Pilka is also a university lecturer and a regular contributor to media channels such as Art Antiques, Flash Art and Artalk. He is the initiator of the Open Collections project, creator of the experimental application DigitalCurator. art, programmer, podcaster and a fan of old and new generative art.

Pavel Sikora is an expert in image processing, computer vision, and neural networks. He received his master's degree in Communications and Informatics in 2018 at the Faculty of Electrical engineering and Communication at the Brno University of Technology (BUT), Czech Republic. During his studies for a Ph.D. at the same university, he wrote several publications focused on computer vision and optical networks. He collaborated on scientific projects focused on video art, analysis of traffic situations and data from cameras in public transport, and an analysis of cryptographic methods based on deep learning applied to side-channel attacks.

ANDREAS SUDMANN

OLIVER STAŠA

Andreas Sudmann is a media scholar, AI researcher and currently coordinator and co-applicant (alongside Anna Echterhölter, Jens Schröter, and Alexander Waibel) of the Volkswagen Foundation-funded research project „How is AI Changing Science? Research in the Era of Learning Algorithms." Recent publications (selection): as editor: Games & AI, special issue of Eludamos, Vol. 10, No. 1, 2019, together with Mathias Fuchs; The Democratization of Artificial Intelligence. Net Politics in the Era of Learning Algorithms, Bielefeld, New York: Transcript/ Columbia UP, 2019; Computerkreativität, in: Götzendämmerung. Kunst und Künstliche Intelligenz. Eds. Bernhard J. Dotzler and Berkan Karpat. Bielefeld: Transcript, 2021, 85-98.

Oliver Staša is a programmer and friend of Alina. Currently working as a Software Engineer at Google on a development team concerning an ML product with wide user interaction & app delivery system. In past avatar ML face tracking open source app at startup Alter, set up ML driven surveillance system at IBM's remote chemistry lab ROBO RXN, web-maker in culture related projects, game studies enthusiast, studied Applied Informatics at VUT and Theory of Interactive Media at MUNI.

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MONIKA SZŰCSOVÁ

GAIA TEDONE

Monika Szűcsová is a researcher, independent curator, and photographer. Her recently defended dissertation centered on the curation of software-based art. More recently, she has been concerned with research related to archiving, preservation, and documentation strategies for software-based art, and plays a contributing role?(Is it still ongoing?) to the practical research project Digital Canon?! carried out by LIMA, Amsterdam. She is part of the online curatorial project The Black Box / Černá skříňka (cerna-skrinka.cz, since 2020). Since 2017 she has been a lecturer of various courses related to digital art history, theory and curating at the Faculty of Arts, Masaryk University in Brno. She is a visiting curator in ScreenSaverGallery (screensaver.metazoa.org).

Gaia Tedone is a curator and researcher with an expansive interest in the technologies and apparatuses of image formation. She completed her PhD at the Centre for the Study of the Networked Image, London South Bank University with a practice-based research entitled 'Curating The Networked Image: Circulation, Commodification, Computation' (2019). With a focus on this topic she also writes, teaches, and curates. Currently, she is working as a Research Associate at the Lucerne University of Applied Sciences and Arts, where she investigates post-photography curation and algorithmic visual culture. She is a Lecturer at University Cattolica del Sacro Cuore, Milan where she runs a laboratory on post-critical museology.

BARBORA TRNKOVÁ

UBERMORGEN

Barbora Trnková is an artist, photographer, curator and a postgraduate student at the Faculty of Fine Arts at Brno University of Technology. In her work she focuses on formulating a shift in photography from taking photos by camera to creating cameras. Her dissertation analyzes features of human-machine communication in the evolution of technology and the phenomena that accompanies the creation of art in any medium. She is co-founder ScreenSaverGallery, and part of the art duo &.

http://barboratrnkova.cz/,
http://metazoa.org/
https://screensaver.metazoa.org/

UBERMORGEN is an artist duo founded in 1995. Autistic actionist lizvlx and pragmatic visionary Hans Bernhard are net.art pioneers and media hackers widely recognized for their high-risk research into data & matter and polarising social experiments. CNN designated them as 'Maverick Austrian Business People' during their Vote-Auction online project. They reached a global audience of 500 million while challenging the FBI CIA and NSA during the US presidential election. In 2005 they launched their acclaimed EKMRZ Trilogy, a series of conceptual hacks – Google Will Eat Itself Amazon Noir and The Sound of eBay. UBERMORGEN occupies 175 domains. Their exhibitions include New Museum USA Somerset House London Haifa Museum of Art Israel/Palestine (2019) Wei-Ling Contemporary Malaysia HKW Germany ZKM Germany National Art Gallery Bulgaria (2017) ICA Miami USA Mahatma Gandhi Institute Mauritius (2015) Serpentine Galleries London UK (2014) Kunsthal Aarhus Denmark Ars Electronica Austria MoMA Ljubljana Slovenia ArtScience Museum Singapore (2013) 3331 Arts Chiyoda Japan (2012) Centre Pompidou France Gwangju Design Biennale Korea WRO Media Art Biennale Wroclaw Poland (2011) Prague Biennale Czech Republic (2009) Biennale of Sydney Australia (2008) MOCA Taipei (2007) The Premises Johannesburg South Africa ICC Tokyo Japan (2005) SFMOMA USA (2001).

This monograph documents the development of exhibition institutions and the nature of curation throughout the Covid 19 epidemic, with a special focus on the year 2020. It tries to answer the question of how curatorial techniques, communication platforms, and the social role of exhibition institutions have altered as a result of rapid and external circumstances, which compelled the shift from physical gallery spaces to online. It reflects critically on the exhibition project Černá skříňka/The Black Box (TIC Galery), in which several curatorial approaches were applied, including the use of artificial intelligence, and situates it in the broader context of coincident curatorial projects in both the Czech Republic and abroad. Exploring the evolving topology of online curation, these texts reflect on personal experiences and theoretical discourses that are influenced by digital and network media theory.