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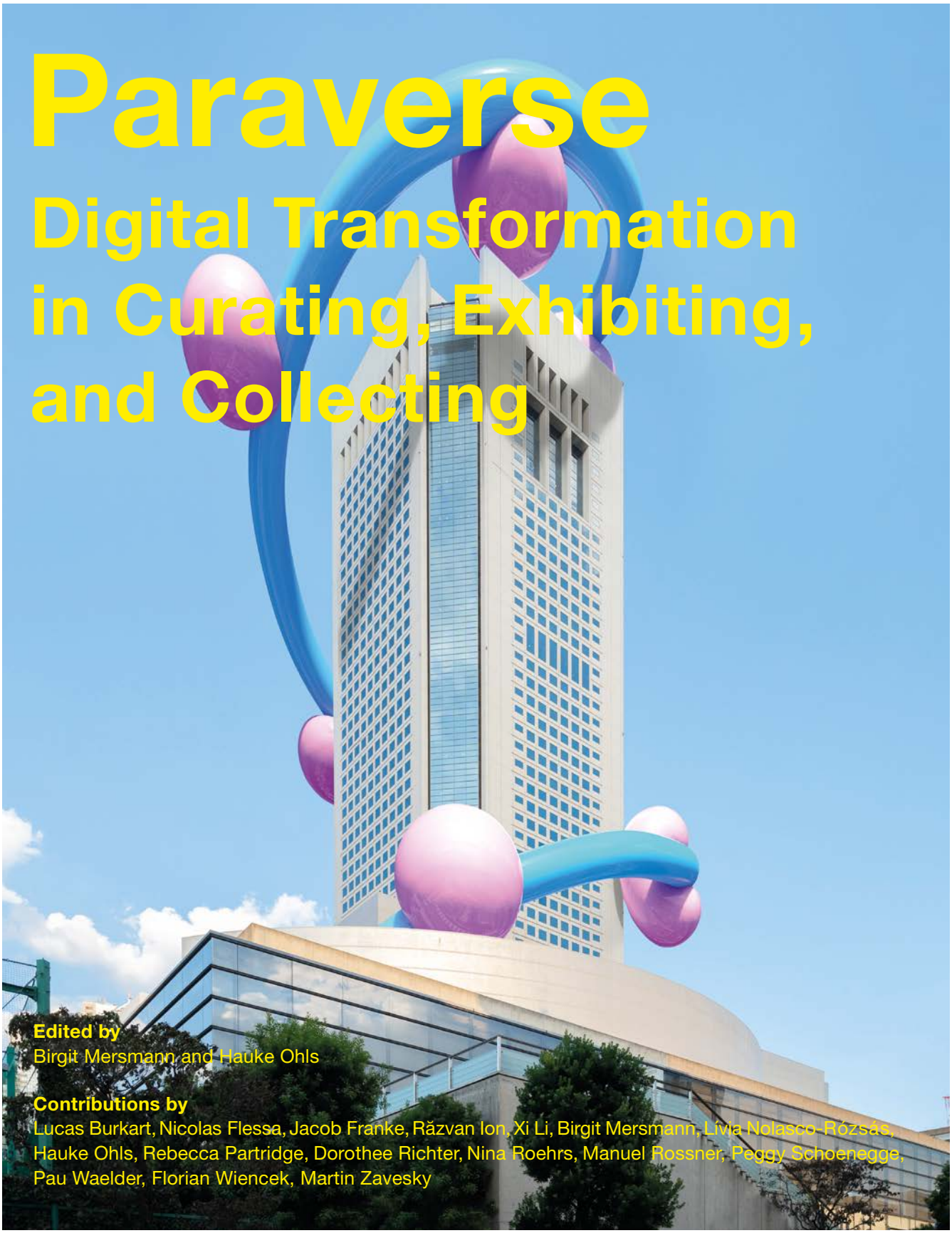
Paraverse

Digital Transformation in Curating, Exhibiting, and Collecting



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Editorial
Paraverse. Digital Transformation in Curating, Exhibiting, and Collecting

Birgit Mersmann and Hauke Ohls

"ON THE INTERNET I AM AN ARTIST."— "ART LOOKS MUCH BETTER ON INSTAGRAM." These statements, declared as conceptual artworks by Düsseldorf-based post-internet artist and curator Florian Kuhlmann, outline the media shift and ambivalent value with which art and artists are confronted in digital, network-based cultures. Parallel to the dependence of artistic design and production processes on digital technology and the internet, the virtualisation of institutionalised forms of presentation, mediation and marketing of art is advancing exponentially. Natively digital art museums, online art collections of museums and galleries, NFT collections of crypto art, online and AI-curated art exhibitions, Insta-Walks, AR and AV in art museums, as well as smartphone-based art presentations illustrate how the digital transformation is resetting the art system.

Drawing upon the concept of 'paraverse,' this special issue deals with the digital expansion and virtual augmentation of curating, exhibiting, and collecting art. The term 'paraverse' is a linguistic short form for parallel universe. From ancient philosophy to contemporary quantum physics, science-fiction, critical posthumanism and the transhumanism of digital capitalism, the term refers to a hypothetical universe beyond the known. The overarching theory of multiple universes assumes that there is not just one, but several parallel worlds that come together in what is known as the multiverse.[1] As an implementation of the scientific concept, there already exists concrete applications of the worlding concept of paraverse, such as the AR NFT metaverse platform PARAVERSE (https://www.paraverse.world/), a network-based multiverse that uses augmented reality, blockchain and geolocation technology to creatively merge the real physical world with virtual world creations.

The journal issue explores which parallel worlds of curating, exhibiting and collecting have emerged in digital spaces and how these can be located in relation to the familiar physical-analogue world of exhibiting and collecting art — whether as an extension of existing institutional practices or a parallel-world phenomenon of a subversive, institution-critical digital culture. It tackles a series of questions that have surfaced in the process of digital transformation: How does the practice of curating art (pre-digital, algorithmically generated and minted art) change through its migration into virtual spaces, cross-realities and automated scenographies? What new display, participation and mediation possibilities do digital and net-based exhibition formats offer? How are public and private collection strategies and practices changing through the introduction of NFTs?

The *Paraverse* issue brings together different theoretical, practical and empirical perspectives from researchers, curators, mediators, critics and artists. Under discussion are the digital image ecologies of curating, showing and mediating art and cultural heritage, the blockchain-induced decentralization and commoning of exhibition-making, collecting, and art sales, the potentials and dangers of artistic value creation and value

preservation in the collective space of virtuality, and the future of art-curating in the age of artificial intelligence. By these themes and research foci, it connects to and expands on two former issues of the journal *OnCurating*: the issue *Curating the Digital* from 2020, edited by Dorothee Richter and Paul Stewart,[2] and the issue *Digital Curating Expanded* from 2023, edited by Christine Kaiser, Li Ruixuan et al.[3] — a bilingual (English-Chinese), revisited and updated version of the 2020 issue.

The collection of contributions is the final outcome of an interdisciplinary lecture series entitled "ParaVerse_Digital Cultures of Curating, Exhibiting and Collecting." It was organized by Birgit Mersmann and Hauke Ohls at the Institute of Art History of the Rheinische-Friedrich-Wilhelms-University Bonn during the winter term 2023/2024 and served as the inaugural event of the newly established Chair of Contemporary Art and Digital Image Cultures. To open a more diverse prospect and to provide a critical assessment of burgeoning AI opportunities and challenges for art curating, exhibiting, and collecting, the selection of lecture contributions was expanded by interviews with influential representatives of the respective fields.

The first section deals with the digital mediation complex while focusing on cultural heritage in GLAM institutions (Galleries, Libraries, Archives, Museums), and the transformative relation between exhibits and audience experience in digital and hybrid museum contexts. Historian Lucas Burkart argues for a digitally informed instead of a technology-driven approach to the management and curation of cultural heritage data. Presenting his *Curiositas* project, a historical digital exhibition of the lost Basel-based Museum Faesch of the 17th century, he stresses that the main emphasis of digital exhibition-making should lie on the curatorial agenda and storytelling rather than on technological tools. Digital curator Jacob Franke and digital strategy officer Martin Zavesky discuss digital formats and mediation strategies for analogue objects with regard to the museum collections of the Staatliche Kunstsammlungen Dresden. Departing from a critical debate of Walter Benjamin's aura concept against the horizon of digital reproduction and simulation, they conclude that the paraverse of the digital has the potential to enrich the live experience of the auratic object, but that this only works through reconnection with the analogue world of embodied museum experience. Florian Wiencek, founder and CEO of Musealisten, a studio for digital mediation**,** presents five key strategies of how Augmented Reality can be employed for curating or mediating art and culture in museums. Instead of comprehending digitally augmented space as a separate parallel universe, he advocates for a holistic museum experience merging the physical and digital world(s). Augmented Reality also plays a key role in the visual essay by digital artist Manuel Rossner. During his Domus artist residency in Galatina in Southern Italy, he discovered a parallel structure between the local limestone Pietra Leccese and informatic Reaction-Diffusion or Turing patterns, i.e. the natural and artificial digital world. By digitally simulating the materiality of the stone and dropping it on the kitchen table of his apartment, he exhibits the paraversing of his real living condition with the destructive force and dissolving dynamics of the pulverizing stone. In *(Un)Real Worlds of Digital Curating*, curatorial scholar Dorothee Richter reactivates Marxist and Situationist theories, arguing that the digital age imposes "passive contemplation," replacing sensory engagement with spectacle consumption. NFTs epitomize this by transformimg conceptually fluid digital art into speculative objects that are then displayed conservatively in white cubes for validation. The author proposes "situated curating" as resistance — emphasizing bodily presence and shared environments to re-anchor art in tangible reality, countering digital "placelessness."

The six contributions of the second section take a closer look at the digital exhibition complex. Art historian Birgit Mersmann explores an emerging global phenomenon of the digital exhibitionary complex: Immersive digital art exhibitions staged as art-historical spectacles in memory-ridden real places of historical significance. Providing an image-theoretical analysis of immersive digital art exhibitions in the legacy of Albert Plécy's concept and technology of the "Image Totale," she demonstrates that immersive digital art exhibitions have evolved as a new tech-centric exhibition genre with the industries of digital image creation and that they serve the profit-oriented function of para-sites. Curator and curatorial scholar Lívia Nolasco-Rózsás presents her international collaborative project *Beyond Matter*, a practice-based research on exhibition-making under virtual condition. Focusing on spatial aspects, she reflects on the digital revival of past landmark exhibitions as well as the digital curation of new art and archival exhibitions. From a technology-historical, space-theoretical and user-participatory perspective, (digital) curator and art scholar Peggy Schoenegge traces the emergence and transformation of curating web-based exhibition spaces. Including own projects by the curatorial collective "peer-to-space," she argues that within the paraverse of the web, new speculative exhibitions formats can be created that leave behind traditional approaches. The internet as exhibitionary complex is also the topic in art historian Hauke Ohls's deep analysis of Jakob Kudsk Steensen's works *Berl-Berl* and *Boreal Dreams*. Interpreting the exhibits of live simulations against the grain of Jonathan Crary's harsh critique of the internet complex, he stresses the significance of a digital-ecological paraverse for the artistic creation and reflection of more-than-human life-worlds.

The introduction of the blockchain ecosystem has exerted great impact on the digital exhibition complex and the global art market. Nina Roehr's personal curator report on the crypto art exhibition *DYOR. Making Sense of the Crypto-Artworld*, and Rebecca Partridge's interview with the crypto art critic and market expert Pau Waelder examine this disruptive paradigm shift. They reflect, even question the idea and practice of decentralized curating, assess the interactive involvement of audiences in the creation of digital collectibles on the blockchain and look into the market share of NFT-based art and exhibition making.

The third section scrutinizes the queering of human and machine curation in the rising AI complex. It consists of two interviews and a manifesto-like text on the "queer multiverse." Birgit Mersmann's and Hauke Ohls's interview with curator and researcher Li Xi from Aiiiii, a research lab for art and artificial intelligence supported by the College of Design and Innovation at Tongji University, Shanghai, discusses the potentials, challenges and limits of exhibiting AI art across the paraverse and considers how AI-driven A-Life art could contribute to a deeper understanding of ecological issues with respect to a more-than-human world. Nicolas Flessa's interview with curator and critic Răzvan Ion moots how a collaborative partnership and genuine symbiosis between human and machine intelligence could redefine the curation of art. It provides insight into the creation of the 10th Bucharest Biennale (2022), the first-ever art biennale curated by an artificial intelligence system in VR. In the final article of the section on the AI complex, curator, critical thinker and tech-queer activist Răzvan Ion opts for a Multiverse Radical AI, i.e. a more inclusive and diverse AI that acknowledges the inherently queer nature of artificial intelligence. The manifesto-like text is a call for reimagining Free Radical AI from a queer perspective.

We as editors hope that the articles and interviews merged in this issue contribute to a deeper theoretical and practical techno-cultural understanding of the ongoing digital transformation in art curating, exhibiting and collecting, and that they provide orientation

of how to navigate constant change within the art world. We would like to express our sincere thanks to all authors and interview partners for their insightful and enriching contributions, to Dorothee Richter and Ronald Kolb from *OnCurating* for their continuous editorial support, and to the Gielen-Leyendecker Foundation and the Open Access Service Center of the University of Bonn for their generous financial support to enable this open access publication.

Notes

1 See Paul Booth, *Entering the Multiverse: Perspectives on Alternate Universes and Parallel Worlds* (Oxford: Routledge, 2025); Simon Friederich, *Multiverse Theories. A Philosophical Perspective* (Cambridge: Cambridge University Press, 2021); Ana Alsonso-Serrano et al., *The Multiverse* (Basel: MDPI–Multidisciplinary Digital Publishing Institute, 2020); David Wallace, *The Emergent Multiverse: Quantum Theory According to the Everett Interpretation* (Oxford: Oxford University Press, 2012).
2 https://on-curating.org/issue-45.html.
3 https://on-curating.org/issue-56.html.

Birgit Mersmann is Professor of Contemporary Art and Digital Image Cultures at the University of Bonn, Germany. Her interdisciplinary research covers modern and contemporary Western and East Asian art, global art history, migratory aesthetics, museum and exhibition studies, digital art, image and media theory, visual cultures and visual translation, interrelations between script and image, and history and theory of photography. Recent book publications include: *Kritik des Neo-Extraktivismus in der Gegenwartskunst* (ed. with Hauke Ohls, Lüneburg 2024); *Image Controversies. Contemporary Iconoclasm in Art, Media, and Cultural Heritage* (ed. with Christiane Kruse and Arnold Bartetzky; Berlin/Boston 2024); *Okzidentalismen. Projektionen und Reflexionen des Westens in Kunst, Kultur und Ästhetik* (ed. with Hauke Ohls, Bielefeld 2022); *Über die Grenzen des Bildes. Kulturelle Differenz und transkulturelle Dynamik im globalen Feld der Kunst* (Bielefeld 2021); *Bildagenten. Historische und zeitgenössische Bildpraxen in globalen Kulturen* (ed. with Christiane Kruse; Paderborn 2021); *Handbook of Art and Global Migration. Theories, Practices, and Challenges* (ed. with Burcu Dogramaci; Berlin/Boston 2019).

Hauke Ohls is a postdoctoral researcher with the Chair of Contemporary Art and Digital Image Cultures at the University of Bonn, Germany. His research focuses on theoretical, sociological, and philosophical questions of modern and contemporary art with particular emphasis on eco-relational art and ecological aesthetics, neo-extractivism, ecofeminist, pluriversal, posthuman theory, the discourse on objects, materiality and images, as well as the relationship between art, economy, and neoliberalism. Additional areas of interest include the intersection of art and music, artists' writings, media art, and transcultural art history. Recent book publications include: *Kritik des Neo-Extraktivismus in der Gegenwartskunst* (ed. with Birgit Mersmann, Lüneburg 2024); *Many-Valued Aesthetics. Interconnections in the Work of Mary Bauermeister* (Bielefeld 2024); *Okzidentalismen. Projektionen und Reflexionen des Westens in Kunst, Kultur und Ästhetik* (ed. with Birgit Mersmann, Bielefeld 2022); *Objektorientierte Kunsttheorie. Graham Harmans spekulative Philosophie im Kontext einer (nicht-) relationalen Ästhetik* (Hamburg 2019).

I. The Digital Mediation Complex. Paraversing Museum Collections

Cultural Heritage in the Digital Age — Some Considerations and a Use Case

Lucas Burkart

Like many seemingly transformative moments in media history, the digital turn has inspired both exaggerated hopes and bleak doomsday prophecies in equal measure. Shifting the discussion beyond these equally unrealistic expectations requires a candid assessment of the opportunities digital technologies can offer to cultural heritage alongside a critical reflection on their use and wider impact. While GLAM institutions[1] must fulfil a number of requirements to successfully realise the potential of digital technologies, they also need to take a political stance when making their holdings digitally accessible.

This article advocates for a digitally informed, but not technologically driven approach to cultural heritage as data. The goal is less to bring digital technologies to the GLAM sector — this has been happening for at least thirty years — than to highlight ways of transferring curatorial expertise to the digital sphere. Hence, the 'mantra' is: technology follows application. Above all, it is essential that the digitisation of cultural heritage follows internationally acknowledged standards such as FAIR, LOUD, and CARE. This involves at least three steps: the process of digitisation as such, the parallel application of accepted metadata schemes and formats, and the creation of open interfaces (APIs) for the reuse of data and metadata. In most cases, this goes far beyond what many GLAM institutions currently offer as their online collection.

The Disenchantment of Digital Technologies

In the world of start-ups, the view has long since been established that the most exciting and influential innovations arise from the merging of 'fuzzy' and 'techie' expertise, referring to the Social Sciences and Humanities on the one hand, and technology development on the other. By contrast, the GLAM sector is still defensive about the potential of digital technologies and hence largely misses out on the opportunity to adequately exploit them for its own purposes. Therefore, a change of attitude is needed. First of all, the idea that 'techies' control better and more relevant knowledge has to be abandoned, as they are equally unable to solve GLAM-specific problems with codes and algorithms alone. Techies are only marginally concerned with the challenges of the GLAM sector, often lack a proper understanding of the complexities of cultural heritage, and thus are unlikely to propose the most fitting applications of their own technologies. The advent of analytical and generative AI will not change that.

The merging of skillsets from technology and GLAM professionals therefore appears as promising endeavours, yet its implementation must be achieved by means of a true collaboration between equals. This would not only allow for workflows and processes to become more efficient and comprehensive, but also for digital technologies to be used adequately for content-related and creative work in the GLAM sector. In the same way as tools have enhanced human capabilities throughout history, digital technologies can advance the societal importance of GLAM institutions. Here, too, humans and machines best work together, as Scott Hartley puts it.[2]

Cover of *The Economist*, May 6, 2017

Cultural Heritage as Data

The metaphor of data as the new oil has been widely established since the May 2017 issue of the *Economist*. While the liberal magazine was primarily concerned with the need for legislative regulation, the metaphor itself emphasises two aspects of digital technology development that are relevant here.[3] First, it reveals a shift in the understanding of data from an item of personal property to an extractable and potentially marketable resource. Second, and consequently, it hints towards a specific value creation cycle. The media scholar David Buckingham got to the heart of this notion when proclaiming that "data is the new oil, we need to find it, extract it, refine it, distribute it and monetize it."[4]

This view, of course, does not encapsulate a neutral description of the data life cycle. Rather, it describes the business model of Big Tech and private industries.[5] The preservation and curation of cultural heritage, however, has always been an act of knowledge creation and dissemination rather than an investment yielding immediate financial returns. An understanding of cultural heritage as data does not change that, but it can advance the mission of GLAM institutions by introducing new, digital formats of communication and participation.

In short, the GLAM sector must not fall into the trap of copying business models from the IT industry. Instead, it should aim to create its own, independent value creation cycle. The most basic prerequisite for this endeavour is the careful curation of data, in accordance with internationally acknowledged standards tailored to the needs of cultural heritage preservation and research. The goal is to exploit data and the ensuing technologies for the benefit of cultural heritage as a public good; challenging and reversing Buckingham's claim, it is about the public capitalisation of data and digital technologies rather than about their monetisation for private gain.

Preventing Data (Ab-)Use

The fact that public and private interests are sometimes at odds and require the balancing mediation of governance is a truism of liberal societies. In the given context, the conflict between private and public value creation cycles is rooted primarily in the former's use (or rather, abuse) of publicly available — and hence publicly-owned — digital data. While the benefits of Open Access (OA) and Open Research Data (ORD), by now the dominant paradigms for the dissemination of publicly-funded research, are rightly undisputed, both principles were first conceived in the 1990s and thus largely predate the more recent advancements in digital technology. However, this undoubtedly contradicts their original intentions, as they are actively contributing to publicly funded research feeding the value creation cycle of private IT companies for free. This by now deplorably frequent practice results in the absurdity of private companies using publicly-owned data free of charge, only to develop products that they then sell back at a profit to the public sector and individual taxpayers.

A fairly simple solution to this problem — pending some basic strategic coordination between public funding agencies and the GLAM sector — would be the insistence on a condition that the private sector routinely attaches to its own products and services with considerable eagerness: 'not for commercial (re-)use.' This measure — which, for example, could be communicated by means of a label, watermarks or tailored creative common licenses for all data not only digital visual content — is all the more urgent as private companies increasingly and proactively seek to collaborate with GLAM institutions with the (typically unstated) agenda of expanding their data pools. Lately, this thirst for data is often driven by a desire to train so-called Large Language Models (LLMs) that form the basis of various artificial intelligence applications.[6] The deal companies strike is simple: they cover the costs of digitisation, then use the generated data for their own purposes. From a GLAM perspective, however, it is a worryingly bad deal because the interests underlying the respective value creation cycles are diametrically opposed to each other. While publicly-funded holding institutions have an interest in Open Access and Open Research Data, companies aim to reserve the same data for their exclusive profit-oriented use. Claiming the right to freely use the data themselves, they deny the equivalent right to their partners and thus to the public as a whole.

Where such contracts have already been signed, not much can be done to change them. However, wherever new data is made openly accessible, it is indispensable to learn from private industry and label such data as 'not for commercial use.'[7] This does not mean that GLAM institutions should compete with the private sector in a market setting; yet, they should protect cultural heritage from private monetisation by ensuring that public goods remain public even in the form of data, that is, accessible and (re-)usable free of charge. This policy should guide all future digitisation initiatives in the GLAM sector.

All these considerations are ultimately based on the fact that global cultural heritage represents an enormous treasure trove whose digital availability is constantly growing. However, the rapid development of generative AI in particular poses a challenge not only in economic and democratic terms, but also with regard to the ownership and interpretation of cultural heritage. Besides their commercial interests, AI applications routinely use publicly-owned research data in probabilistic and non-transparent ways. From the perspective of cultural heritage, historical studies, and academic research in general, this is tantamount to the annulation of all scientific and methodological standards and, therefore, to total surrender. New research agendas to increase data transparency and trustworthiness are desperately needed.

Curiositas 5.0—First Steps Towards a Bigger Vision

In the following, I will discuss a digital exhibition project (online since 2023) as a use case to illustrate the experiences, opportunities, and challenges of the digital expansion of the GLAM sector. At the centre of the project lies a cabinet of curiosities that was founded in the mid-seventeenth century: the Museum Faesch.[8] This collection has been managed by the family of its initiator for a good 150 years, and eventually transferred to the collection of the University of Basel at the beginning of the nineteenth century. Shortly afterwards, owing to the increasing specialisation of academic disciplines, the holdings of said cabinet were divided into three special collections. Such was the fate of many historical cabinets of curiosities all across Europe, whose original context as a research tool and a place for the production and preservation of knowledge was thus irretrievably destroyed. In the case of the Museum Faesch, however, the collection's holdings remained entirely in the possession of the city of Basel. Today, they are preserved in the university library, the historical museum, and the art museum. In a certain sense, the Museum Faesch therefore still exists, albeit only as a collection of disjoint and largely inaccessible artefacts.

Against this backdrop, I will focus on four facets that were relevant for the implementation of the digital project *Curiositas 5.0*.[9]

1. From Visibility to Reusability

It is well known that only about five percent of the cultural heritage held in museums and collections is actually being displayed, and hence a significant proportion of the holdings remains largely invisible to the public. As a result, they are also only partially available for research. It has been repeatedly suggested that digital technologies provide a potential solution to this problem by massively increasing the visibility and availability of cultural heritage.[10]

The *Curiositas* project reunites more than a thousand artefacts that were originally held in the Museum Faesch. In a 'gallery' section, they are presented as a tapestry and can be searched by author, title, year, and other criteria.[11] Metadata provide the basis for all forms of organisation in this 'gallery,' and the structuring and normalising of the metadata was therefore a mandatory prerequisite for ensuring the interoperability of the digitised artefacts. This step, however, proved particularly challenging as all of the involved institutions use different systems to generate and store (meta-)data. This is due to disciplinary traditions and the gradual conversion from analogue to digital work processes, which has been increasingly taking place in GLAM institutions since the 1990s.

Thus, the project's 'gallery' provides access to, and ensures the visibility of many of the artefacts that originally formed the Museum Faesch. However, access to and visibility of a collection are not enough. Both the viewing public and the scholarly community increasingly requires cultural heritage to be made available and accessible as reusable data. Labelled 'not for commercial use,' this data must be made available by GLAM institutions free of charge.

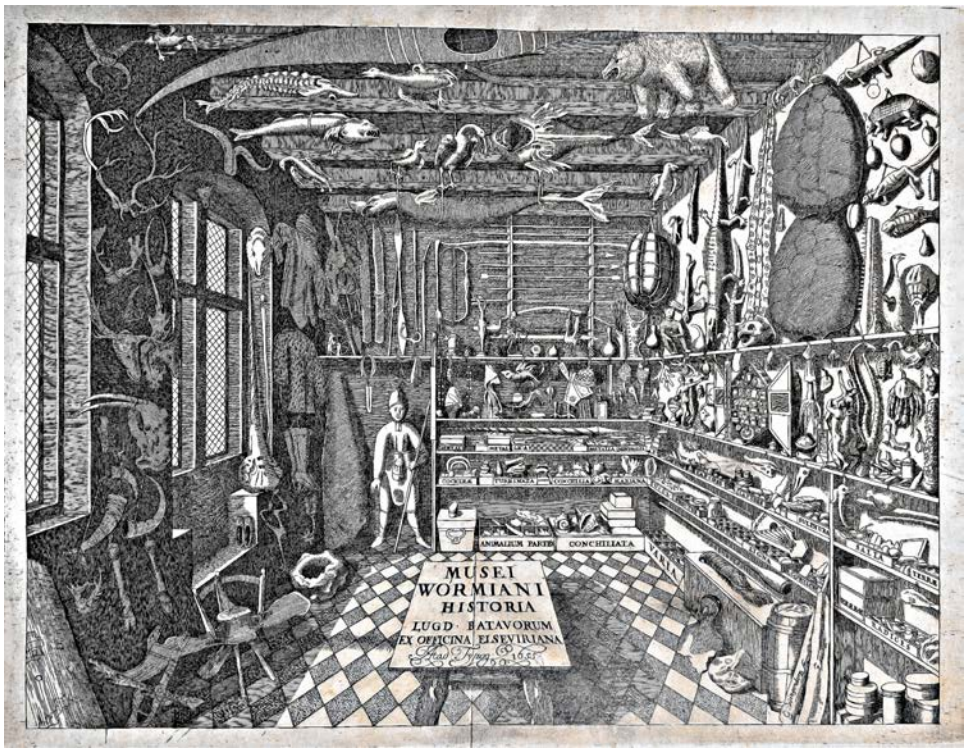
2. Curatorial Intention

In contrast to the purposefully uncurated gallery, a completely different presentation was needed to convey an understanding of the cabinet of curiosity as a historical site of knowledge production. The project actively applies the eponymous concept of curiosity for this very purpose, thus highlighting curiosity as a general driving force for scientific endeavours since the early modern period. In addition, curiosity is understood as the principal curatorial concept as it captures the essence of an early modern cabinet of curiosities in a paradigmatic way.

In a section entitled 'object constellations,' a diverse range of objects, such as paintings, *naturalia*, coins, drawings, and books are brought together to create unexpected connections across different genres and media. Taken out of their collection furniture and gathered in an assemblage, they represent the dynamic framework in which established knowledge was confronted with previously unknown objects and new observations. From the discovery of previously invisible connections between different items, new ideas could arise. As Frans Francken reveals in his 1617 painting, a variety of different items were often presented and thus made accessible to collectors and visitors, who studied and arrayed them, discussed, replaced, and rearranged them over and over again.

The dynamics of these scientific practices also had to be conveyed in the digital project. Thus, the screen turns into a virtual collection table, the likes of which often were the centrepiece of a cabinet of curiosities, as the well-known 1655 depiction of the Museum Wormianum suggests.

Frans Francken the Younger (1581–1642), *The Cabinet of a Collector*, 1617, Oil on panel, 76.7 x 119.1 cm, Royal Collection Trust (RCIN 405781).



Ole Worm, *Museum Wormianum*, 1655, Frontispiece, Amsterdam, print by Ludwig and Daniel Elzevir.

The digitisation of the GLAM sector cannot and must not be limited to the accessibility and visibility of collection holdings. Digital initiatives should also pursue curatorial intentions, which must be clearly stated. As with analogue exhibitions in museums, many aspects must be considered when developing a workable curatorial position. It is crucial, however, that the use of technological solutions serves the curatorial idea — and not the other way around. In this sense, the whole exercise is less concerned with bringing digital solutions to the museum than with exemplifying the transfer of curatorial expertise into the digital domain.

3. Storytelling

Unlike museum spaces, digital exhibitions are not subject to the restrictions of the space-time continuum. Travelling from one continent to another, from one century to another, is possible with the same ease as turning a page in a book: all it needs is a click. This opens up a virtually endless range of opportunities, yet it also carries the risk of users getting lost in the technology.

In addition to accessibility/visibility and a curatorial intention, the project uses digital storytelling to guide users through the eventful history of the museum. The collector's excitement when he, for the first time, saw his Yucca palm blossoming in his garden; the circulation of ancient coins between Basel and Lyon; the social capital the family drew from its ties with Napoleon; the visit of an imposter prince from Egypt who left his tughra in the visitors' book — these are just a few episodes from the long history of the Museum Faesch. Alongside many similarly peculiar and intriguing narrative strands, they can be experienced in a separate 'storylines' section.[12]

This approach presents the Museum Faesch, its artefacts, as well as its owners and visitors, within a context of local urban history, the history of knowledge in Europe, and its interconnectedness in a *République des Lettres*. Supplemented by additional

Allegorical representation of the Faesch Collection in the rector's register of the University of Basel for the year 1672 and the Rectorate of Christoph Faesch, the brother of the collection's founder. Rektoratsmatrikel vol. 3 (1654–1764), UBH AN II 4a, fol. 47r.

artefacts from other museums and using a variety of different media formats, the 'storylines' convey the wider historical background of various transformations the Museum Faesch underwent from the Renaissance to the Restoration of the early nineteenth century.

While storytelling is an essential method for the museological communication of (historical) content, such stories must be carefully conceived, developed, and presented. Put differently, visitors must be guided through the digital materials, which cannot responsibly be delegated to technology. Clicking alone does neither generate stories nor history.

4. User experience

Digital applications have great potential to enhance user experience with respect to cultural heritage. The spectrum of technical possibilities is very broad, ranging from simple functionalities such as zooming to the gamification of content. It is, however, essential that the choice of technologies is motivated and determined by curatorial objectives, as it is not expedient to use technical possibilities for their own sake.

Faesch Family Names, Wordcloud of names as reflected in the marriages, members of the Faesch family contracted during the 17th century. Accessed October 30, 2024, https://curiositas.digitalesschaudepot.ch/en/datastories/kleio:set_9005a8a4-1f03-4635-949b-23d32cb47026/.

In the *Curiositas* project, we decided to assign a specified but limited number of technical features to each of the four conceptual entry points, so that the curatorial intention is continuously supported and strengthened by user interaction. In the 'object constellations,' where attention is directed to the collection as a network of artefacts, users can themselves select relations between objects and thus learn more about specific connectivities. By contrast, the 'gallery' presents every item in its own right, applying different digital formats (high-res photography, photogrammetry) and features (zoom, 3D-handling) to support closer inspection, and allows for the downloading of data and metadata. The 'storylines' section, on the other hand, combines different media formats (text, images, video, audio) for the purpose of attractive storytelling. It involves the user in the narration by crossing textual and visual narratives, inviting them to consciously select between text and image.

A final section labelled 'datastories' exploits digital tools for the visualisation of aggregated data relevant to the Museum Faesch, such as a geo-referenced representation of the books' publication sites, or the family ties as reflected in the marriage members of the Faesch family contracted in the seventeenth century. Finally, a machine learning tool exploits Remigius Faesch's handwritten library catalogue, which can be searched by author, title, year, and place of publication. Here, the intention was to playfully introduce the user to machine learning systems and, at the same time, to explain these technologies and their limitations, for instance by highlighting character error rates in handwritten text recognition applications (HTR).

Conclusion

The *Curiositas* project is a paradigmatic use case because its implementation entailed many of the structural challenges GLAM institutions face when treading the path of digital transformation; from data curation and issues of interoperability between disjointed holdings to questions of copyright and the selection of appropriate digital tools. None of these challenges are new in the context of cultural heritage. The digital

transformation, therefore, is impactful with respect to the practices and formats that deal with cultural heritage rather than fundamentally changing its substance or essence.[13] As mere toolkits, digital technologies offer numerous opportunities for added value. To benefit from this, several aspects must be kept in mind:

– Cultural heritage must be digitized, sustainably stored, and made accessible for free reuse according to internationally acknowledged standards.

– The use of cultural heritage as data can make holdings more accessible and inclusive; in this way, digital technologies contribute to shape identities and, therefore, empower the societal relevance of cultural heritage as a whole.

– When thinking of cultural heritage as data, the principal focus must still lie on curatorial intentions and storytelling rather than technology. Even the most advanced technological solution quickly loses its fascination if it is not used to convey an encompassing intention or message.

– The encounter with cultural heritage seeks to negotiate present-day interests and (research) questions with the past. Technology alone is not able to provide satisfying answers, but it can enhance our understanding and thus contribute to communicating and transmitting new discoveries and knowledge.

Notes

1 GLAM is the acronym for galleries, libraries, archives, and museums. When referring to GLAM institutions this article intends public sector institutions.
2 Scot Hartley, *The Fuzzy and the Techie. Why the Liberal Arts will Rule the Digital World* (Houghton Mifflin Harcourt) 2017.
3 Luke Stark and Anna Lauren Hoffmann, "Data Is the New What? Popular Metaphors & Professional Ethics in Emerging Data Culture," *Journal of Cultural Analytics* 4, no. 1 (2019), https://doi.org/10.22148/16.036.
4 The metaphor goes back to a quote by mathematician and data scientist Clive Humby from 2006. Buckingham and others expanded it by the idea of the value creation cycle. See: Charles Arthur, "Tech giants may be huge, but nothing matches big data," *The Guardian*, 23 August 2013.
5 In recent years, criticism has grown louder that large IT companies — legally secured by TOCs hardly anybody reads — find and extract data from their users without appropriately compensating them in order to transform those users into customers that buy their own data back, once "refined." See for instance: Martin Andree, *Big Tech muss weg! Die Digitalkonzerne zerstören Demokratie und Wirtschaft. Wir werden sie stoppen* (Frankfurt a.M.: Campus Verlag, 2023).
6 A relevant example that is indicative of the scenario described is the Google Books project, in which four leading Swiss public libraries are working together with the Californian tech giant.
7 This claim must be maintained, even though it is still unclear how proof of misuse of data labelled in this way can be legally established. So far, this has not been successfully implemented anywhere.
8 Originally from southern Germany, the Faesch family acquired Basel citizenship in 1409 and soon became part of Basel's upper class. As merchants, tradesmen and members of the university, they amassed considerable wealth and held continuously high offices in the city council and government from around 1500. Through clever marriage, they joined forces with other patrician families in the city. In Basel, the

family still exists today. See: Samuel Schüpbach-Guggenbühl, "Faesch," *Historisches Lexikon der Schweiz*, accessed February 10, 2025, https://hls-dhs-dss.ch/de/articles/020960/2024-08-22/.
9 "CURIOSITAS 5.0—Museum Faesch. A cabinet of curiosities as a site for digital amazement," accessed February 10, 2025, https://curiositas.digitalesschaudepot.ch/en/.
10 See for instance the "European Commission report on Cultural Heritage: Digitisation, Online Accessibility and Digital Preservation from June 12, 2019," accessed February 10, 2025, https://digital-strategy.ec.europa.eu/en/library/european-commission-report-cultural-heritage-digitisation-online-accessibility-and-digital.
11 "CURIOSITAS 5.0—Gallery," accessed February 10, 2025, https://curiositas.digitalesschaudepot.ch/en/gallery/.
12 "CURIOSITAS 5.0—Storyline," accessed February 10, 2025, https://curiositas.digitalesschaudepot.ch/en/storylines/kleio:set_209d6ce8-0aab-45dd-aa58-74d79fb34378/.
13 Andreas Fickers, "What the D does to history: Das digitale Zeitalter als neues historisches Zeitregime?," *Digital History: Konzepte, Methoden und Kritiken Digitaler Geschichtswissenschaft*, ed. K.D. Döring et al. (Berlin: De Gruyter, 2022), 45-64. Fickers argues that the 'D' also implies a shift on an epistemic level; new data driven practices and formats also transform the way we think about history. Accordingly, he calls for digital hermeneutics that is aware of these effects, understands their technological underpinnings and enables us at the same time to critically reflect them. This aspect is rapidly gaining in importance with analytical and generative AI; it opens up a new field of research that is in great need of critical reflection from the Social Sciences and Humanities.

Lucas Burkart has been professor of Medieval and Renaissance History at the University of Basel since 2012. His research interests include the cultural history of the Middle Ages and the Renaissance, their global interconnectedness, and the history of historiography. He is currently supervising the critical edition of the works of Jacob Burckhardt. Furthermore, he runs the ongoing research project "Economies of Space. Practices, Discourses and Actors in the Basel Real Estate Market (1400–1700)" that is based on digital technologies, AI-based methods to access data, and computer-assisted evaluation methods. Finally, with the initiative "Digitales Schaudepot", he drives his vision of open cultural heritage in the digital age. His latest publications include: *Materialized Identities. Objects, Affects and Effects in Early Modern Culture,1450-1750* (Amsterdam: Amsterdam University Press, 2021) and *Burckhardt. Renaissance. Explorations and Re-readings of a Classic* (Göttingen: Wallstein Verlag, 2021), and *Stadt in Verhandlung. Basel 1250–1530* (Basel: Christoph Merian Verlag, 2024).

Digital Formats for Analogue Objects at the Staatliche Kunstsammlungen Dresden

Jacob Franke and Martin Zavesky

The digital is juxtaposed with the analogue in a world whose essential characteristic is that it does not exist. At least, this is what Friedrich Kittler argued in the early 1990s, when discussions were focused on whether software was a saleable product.[1] Nowadays, software is sold in all kinds of forms, yet Kittler's conclusion remains radically at odds with the genesis of value in historical artefacts, regardless of the market-based development of software. Since the advent of NFTs, the digital has been able to simulate a form of uniqueness or authenticity, but the fundamental dimension of its determinacy continues to take place in the constitution of purely epistemic units that ultimately elude the ontological status of the analogue world.

The digital is the counter-world of the analogue and it is only composed of realities insofar as these can represent different, clearly distinguishable, and thus readable states. The reality of the microscopic cells, whose states — "on" or "off" ("1" or "0") — form their basis, is that which goes beyond their essence as the digital, because these states are known exclusively as units of a pure and residue-free legibility. In this sense, the real therefore only emerges in the digital world where such reading (and writing) fails — as a disturbance and obstacle. Instead, all purposefulness of the state cells is based on the fact that their change of state is readable in a way in which there is nothing that points to a previous or subsequent state. There are no traces of causality that take place in the sphere of reality, but which originate from a world that in its absolute definiteness is alien to the analogue. In the world of the digital, there is no coincidence and no dirt that is not simulated with the deliberate intention of creating it. We are increasingly realizing that these parts of reality are valuable to us. The jubilation over a world purified of the indeterminacy of the analogue, which is exclusively controlled by us, is followed by the counter-movement in which we miss the real and recognize it as something which has always been beyond our control. Noise, imperfection and error become crucial aspects of digital simulation in computer generated imagery and music, because otherwise we perceive them as sterile and lacking credibility. They are part of our idea of reality and one that we are becoming increasingly sensitized to.

In the following, we will address the question of how the real, which by its very nature remains outside the digital, can be dealt with in the increasingly digitizing museum contexts. To this end, we will first explore the notion of realness based on Walter Benjamin's concept of aura, and then use a few examples to present our approach to analogue museum objects in the digital realm.

It is perhaps no coincidence that the term "aura" is once again becoming virulent; it has just been voted the youth word of the year 2024 in Germany. In art studies, it was decisively coined by Walter Benjamin, who used it in the 1930s to qualify the traditional value of art before the advent of mass reproduction techniques. For Benjamin, the aura is something that stands for an idea of the value of art that had to be updated in the face of identical reproducibility through contemporary media technology. Of

Raffaello Sanzio da Urbino, *Sistine Madonna*, 1513-1514, oil on canvas, 265 cm × 196 cm (104 in × 77 in), Gal.-Nr.: 93 © Gemäldegalerie Alte Meister, Staatliche Kunstsammlungen Dresden, Photograph by: Estel/Klut

course, this primarily affects art that is produced with technology that is inherently characterized by its identical reproducibility and thus the indistinguishability of its products. Just as for reproduction, which is inherent in such production, it is equally true of the simulations of the digital world that their value cannot be based on Walter Benjamin's concept of aura.

In a formulation that has since become famous, Benjamin describes the aura as the "appearance of a proximity, however distant it may be."[2] Proximity is granted through the encounter with the object in analogue reality and because this reality is understood as the same spatiotemporal constitution within which previous encounters have taken place, these are brought into correlation with the current encounter as being distant. Millions of people have stood in front of Raphael's *Sistine Madonna* and looked at it, just as we may be doing now. These included Nietzsche, Dostoyevsky and, of course, Augustus III, who brought the painting to Dresden in 1754. It was hidden at Königstein Fortress in the 18th century and brought to Moscow by the Soviets in the 20th century, and in 2022, activists of the "Last Generation" glued themselves to its frame. Earlier than all that, Raphael himself once stood in front of it and saw what we see now. He placed his brush in the exact spot where we can now trace it. All these previous encounters are brought into the "here and now" of our confrontation with the object, because the object is the same and because the space of the encounter — the real world — is the same.

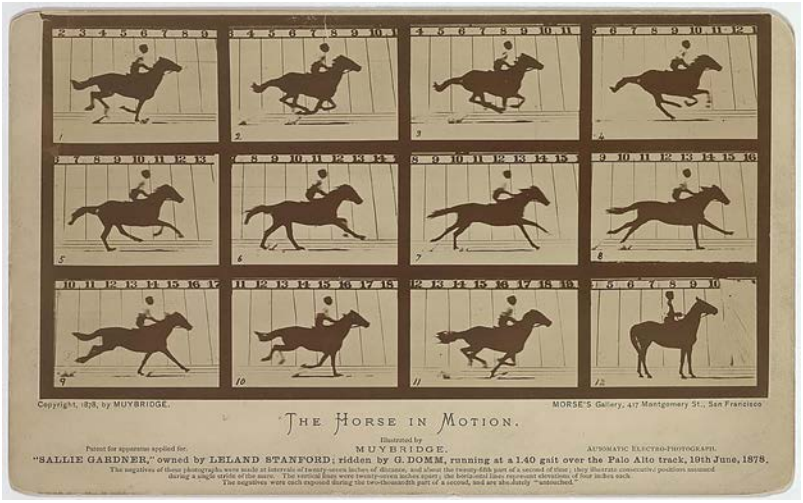
However, it is by no means only the stories that are told, but rather an infinite network of possible narratives in which the *Sistine Madonna* is integrated, some of which are known, some vague and uncertain, some perhaps only made up, that make up its aura. For the aura of the work of art is not exhausted in the formulation of narratives but rather characterized by the potential of an indeterminable number of possible narratives about the distant that it brings close to us, including legends whose truthfulness may be rather doubtful. The aura is therefore not a sum of narratives, but always goes beyond what can be said — something it has in common with the real. The encounter with the auratic work of art is therefore by no means a mere pleasure in its sensual perception, but a pleasure in recognizing oneself as part of a larger whole, at the center of which the artefact is located. While the individual stories do not constitute the aura as summable components, it does help to recount them to evoke awareness of the infinite narrative potential of the whole.

In the case of reproductive works of art, one might argue against Benjamin that they too can achieve this once they are out in the real world. For even if the aura may go far beyond what is sensually apparent in the object, traces of its real existence manifest themselves in the object, in which the distance that characterizes its aura can be sensed. An old photograph may turn pale, bend and I can leave my fingerprint on it, so that its historicity can also gain a sensually perceptible dimension, which can once again inscribe the uniqueness that was supposedly abolished by the reproduction technology at the beginning of its existence. In the digital, however, this is completely impossible. Because it does not exist but is only ever temporarily constituted as an identical state of readability of arbitrary binary cells, it is impossible that anything real could leave a mark on it. But what does this mean for our digital handling of auratic objects, as we find them in our collections at the Staatliche Kunstsammlungen Dresden?

First, it means that the digital cannot take anything away from them. The question must therefore be, what can it add? Benjamin also asked himself this question. When he speaks of the work of art in the age of its technical reproducibility, by "technique" he does not mean the processes of its creation, as the ancient Greeks did, but rather its apparative autonomization, a kind of outsourcing or dehumanization. In extreme cases, human involvement is reduced to the press of a button, which merely sets the reproduction process in motion, in the creation of which the human being is no longer involved in any manual way, such as when taking a photo.

For Benjamin, this is associated with radical changes that did not apply to earlier methods of reproduction and which, as he writes, concern the "here and now" of the work of art and the relationship between original and reproduction. Technical reproducibility not only changes the process of reproduction into an independent entity, but also the relationship of the human being to the object. For not only does it release people from the process of production in terms of craftsmanship, but also in terms of sensuality. Marshall McLuhan expressed a similar observation with his famous phrase "The medium is the message."[3] It is not the human sense that determines the selection of what is decisive about a thing, but the medium with which it is recorded or (re)presented, and so it also formally shapes — this is what McLuhan and Benjamin are getting at — the way we relate to things and imagine the world.

A classic example of this is the series of photographs by Eadweard Muybridge, who at the end of the 19th century, using a series of cameras triggered by taut threads, was able to clarify the question of whether there is a moment during a horse's gallop when all hooves are off the ground. This question could not have been answered by using



Eadweard Muybridge, *The Horse in motion. "Sallie Gardner," owned by Leland Stanford; running at a 1:40 gait over the Palo Alto track*, 19th June 1878, photographic print on card: albumen, https://www.loc.gov/pictures/resource/ppmsca.06607/

non-apparative means, i.e. the naked eye. In the whirl of the horse's legs at a gallop, it was impossible to determine whether the legs were all off the ground because we could not concentrate on all four hooves at the same time. The camera apparatus can do this, and so subjective concentration is replaced by the idea of technical objectivity, which enables a doubling of reality (in this case the postures during a horse's gallop) and provides evidence of the reproduced reality by means of technical reproduction.

Similarly, the consequence of our relationship with the digital is not that our notion of an analogue reality cannot be absorbed in the digital and would therefore be considered unreal but that we reshape our notion of reality so that the digital can concern the analogue. In many places their distinction is losing its meaning. Historic artefacts evoke one of the few relationships that can stubbornly withstand this, because simulation never allows us to recognize ourselves as part of the greater whole in the same way an auratic object does.

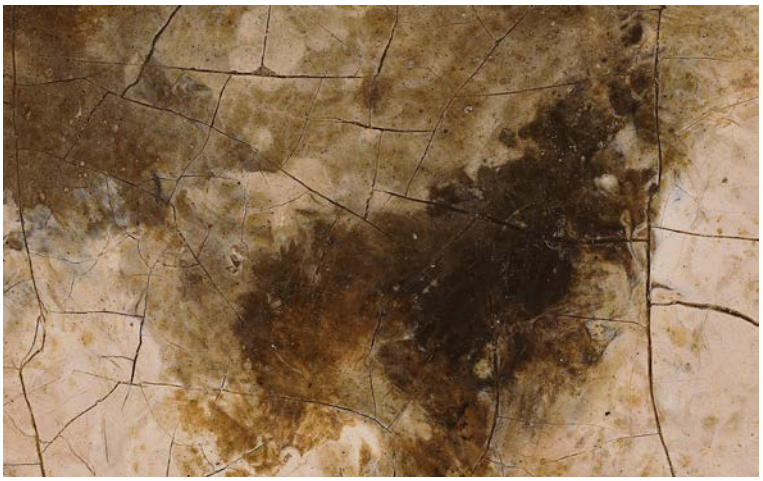
For museums with classic collections, such as ours, this is good news, because it means that people visit museums to have experiences that they would otherwise not be able to have. However, this does not mean that we cannot and should not use the digital as an instrument for describing the analogue, because it can provide us with approaches to the analogue that would otherwise elude us.

First, in a similar way to Eadweard Muybridge's motion studies, this applies to analytical procedures that are analogically impossible. As with Muybridge, of course, this always involves a twofold access: one in which the data is collected (in Muybridge's case the experimental setup with the series of cameras), and a second in which the results of such investigations can be viewed and analyzed. For example, the digital allows for paintings to be captured on a microscopic level and for these details to be presented in high-resolution digital copies not only to researchers but also to the public.

There are countless digital art technology methods that we cannot all name here. The variability of digital media allows us to use them to create a visualization that, for example, allows different views of the same part of an object. A popular example is the curtain viewer, which can show before-and-after images of restorations or juxtapose X-ray images with surface images, as we have done with a series of paintings by

Oscar Zwintscher. A key factor here is the ability to leave it up to the users themselves to decide which part they want to study. This freedom is a specific feature of the digital world that should always be considered, as it activates the users and their interests, so that they can pursue them by themselves. It is accompanied by an effect of self-perception that is evoked in a different way in the analogue experience of the aura that we have been ignoring up to now. For in the encounter with the unique object, the

Johannes Vermeer, *Girl Reading a Letter at an Open Window*, 1657-59, oil on canvas, 83 cm × 64.5 cm (33 in × 25.4 in), Gal.-Nr.: 1336 © Gemäldegalerie Alte Meister, Staatliche Kunstsammlungen Dresden, Photograph by: Kreische



Johannes Vermeer, Detail from HiRox-Scan of *Girl Reading a Letter at an Open Window*, 1657-59, Oil on canvas, 83 cm × 64.5 cm (33 in × 25.4 in), © Gemäldegalerie Alte Meister, Staatliche Kunstsammlungen Dresden, Photograph by: HIROX Europe

Curtain Viewer for: Oskar Zwintscher, *The Artist's Wife as a Young Girl*, 1894, oil on canvas, 68 x 52 cm, Gal.-Nr.: 2022/16 © Albertinum, Staatliche Kunstsammlungen Dresden, Photograph by: Estel/Klut, X-Ray by: Kreische

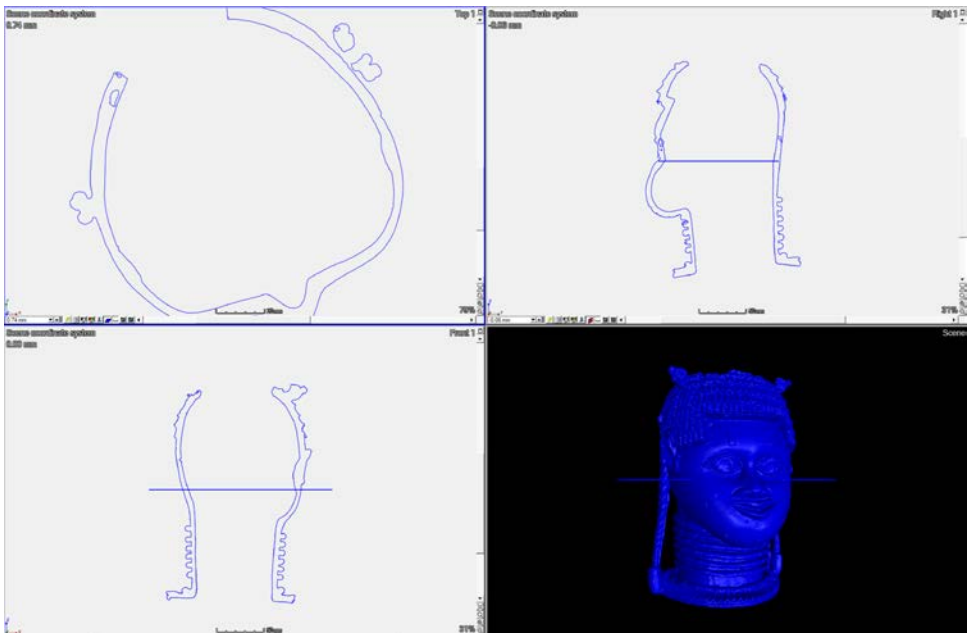
uniqueness of the object is not only effective insofar as it guarantees the link between the proximate and the distant, but also the uniqueness of what encounters the object in the proximate and the distant. Thus, in the face of the auratic object, one always also recognizes oneself as unique, so the mechanism of self-knowledge through the means of interactivity in the digital can, in this respect, be regarded as a substitute for one dimension of the auratic effect.

In the field of 3D graphics, computer tomography (CT) is a common digital technology for looking beneath the surfaces of three-dimensional objects. We are currently developing a 3D viewer to combine CT with photogrammetric digitized images of two Benin bronzes, currently on view in the GRASSI Museum für Völkerkunde zu Leipzig. We have captured these once under normal light and once under UV light so that contamination and other damages can be made visible. In a single program, it should thus be possible to combine two perspectives on the surface with the sectional images of the CT, a form of presentation that would be impossible in the analogue.

We have so far ignored what is probably the most obvious advantage of the digital, but it should be mentioned here, even though it is probably quite obvious. After all, digital views can be sent anywhere without loss via the magical channels of the internet. This is a considerable benefit for researchers, and since the interest of the museum public is often related to the popularity of the artefacts, the dissemination of digital copies is an essential tool for attracting people to the analogue museum. Because in an interesting feedback mechanism, the viral spread of reproductions and digital copies leads to a strengthened awareness of the aura of the original. The crowds that gather around the Mona Lisa every day do not come to see the image, because they have long been familiar with it (and you can't really see it anyway, because you can't get close enough). What attracts them instead is the experience of its aura. It is therefore evidently beneficial for museums to disseminate reproductions and digital copies.

A decisive role is also played by the narratives that lead us to understand the fascination with the auratic potential as the whole that transcends them. In contrast to the clearly limited and quickly overloaded walls of an exhibition, the paraverse is a place of unlimited spatial dimensions, so while we can't experience the magic of the auratic potential's infinity, we have lots of space to give to some of these narratives, which we do in our online collection and multimedia guide. In the digital realm, space can be

flexibly extended, one click can open a window with new layers of depth, in which further materials and even more layers of depth can be gathered. We can accommodate rabbit holes of various sizes in a single display device. We tried something along these lines for the exhibition *Caspar David Friedrich. Wo alles begann* (2024-2025) with a special format. As we were fortunate to draw on the fact that many of the sketches that Friedrich made on his travels and later reused and recombined in paintings can be found in the Dresden area, we were able to locate them in analogue reality and thus



CT-Scan of *Gedenkkopf (uhunmwun-elao) aus Udo*, brass casting, 23,5 x 16,2 x 16,8 cm, Inv.-Nr.: 26228
© Museum für Völkerkunde Dresden, Staatliche Kunstsammlungen Dresden, CT by Fraunhofer IIS Fürth

Photogram of *Gedenkkopf (uhunmwun-elao) aus Udo*, brass casting, 23,5 x 16,2 x 16,8 cm, Inv.-Nr.: 26228
© Museum für Völkerkunde Dresden, Staatliche Kunstsammlungen Dresden, Photogram by: Franke

Photogram under UV-Light of *Gedenkkopf (uhunmwun-elao) aus Udo*, brass casting, 23,5 x 16,2 x 16,8 cm, Inv.-Nr.: 26228
© Museum für Völkerkunde Dresden, Staatliche Kunstsammlungen Dresden, Photogram by: Franke

visualize part of their creation process. The participation of Frank Richter, to whom the localization and cataloguing are largely owed, was decisive for this. Together with him and other Friedrich experts, we filmed short videos on location in which Friedrich's motifs can be recognized and brief information on their creation process is provided.

The format, which we have called "Friedrich's Landscapes," has been very well received, which is probably not least due to the fact that it links the aura of art with the aura of nature.[4] For the mountainscape (or rock or ruin) is thus identified as the mountainscape from the Friedrich painting and a similar awareness of its historicity arises in its encounter as when looking at the painting. Once again, we are enabled to find our-

Caspar David Friedrich, *Bohemian Landscape with Milešovka mountain*, 1808, oil on canvas, 71 x 104,5 cm, Gal.-Nr.: 2197 E © Albertinum, Staatliche Kunstsammlungen Dresden, Photography by: Estel/Klut

Frank Richter near Teplice in front of *Milešovka mountain*, 2024, Screenshot from a film for the *Friedrich's Landscapes* map © Staatliche Kunstsammlungen Dresden, Film by: Franke

selves as part of a whole, at the center of which this time is not Friedrich's painting, but the mountains, which we can view in the same world in which Friedrich saw and sketched them.

However, it is not only space that is limited to museums, but also visitors' time. It makes little sense to present the museum audience with a long text or film within an exhibition because they will hardly take the time to watch it. After all, visiting time is finite, and given the vast number of potentially accessible exhibits, admission is associated with a desire — certainly sometimes unfavorable — not to have missed anything important in the end. It is different in the digital world. Here, I can decide for myself when I want to engage with the material available, without having to pay attention to closing times or my cognitive load, and I can interrupt and return at any time. The public can thus continue their visit to the exhibition on the way home, on the train, on the streetcar, or over Sunday coffee and trace Friedrich's landscapes or watch a film on the creation and reception of the play *Raiders of the Lost Mind* whose puppets it may have seen two weeks ago. I will still be able to do this, long after the exhibition has been dismantled and the space has been filled with a new one. So, the release from the spatiotemporal coherences on which the effect of the aura is based also has its advantages, which are not only of a documentary nature, but also make it possible to extend my engagement with the object. However, in this sphere they compete with a disproportionately higher number of offers vying for attention.

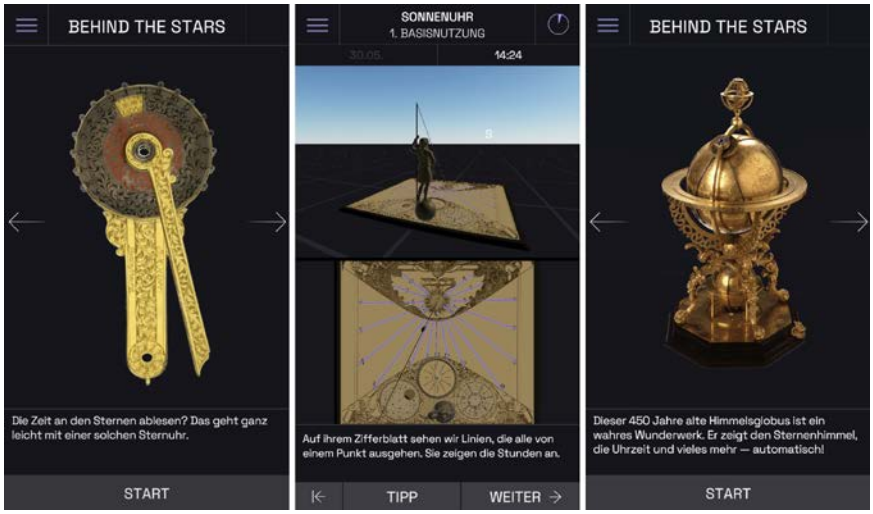
The place occupied by the receptive quality of the auratic experience in the analogue is ideally filled by something else in the digital world, because the reception of the digitized material does not have the same magic as the encounter with the artefact, as we have pointed out. In accordance with the variability of the medium, it is ideally a form of interactivity in which the changeable states can be manipulated by the users themselves. This is not mandatory, but the media-specific potential of the digital ultimately lies in the variability of its states, so it would be a wasted opportunity to remove its manipulation from the user. Just as museum visitors can choose the artefact they look at and the duration of their viewing in the analogue exhibition and pursue their own interests, they should be allowed to do so to the greatest possible extent in the digital realm.

The mechanisms that give the viewer this freedom can be very simple — as with the curtain viewer, for example. Even if I am watching a film on my home device or smartphone, I can skip back or forward and gain a certain degree of freedom that I do not have in analogue cinemas, for instance. Another increasingly popular example is 3D viewers, in which visitors can turn and rotate objects as they please. This may seem trivial at first, but there are various cases in which such turning and rotating can show something that would otherwise remain hidden from the museum visitor because it is logistically challenging and sometimes simply impossible to show in analogue. If we think of sculptures or objects in the porcelain collection, for example, a type of presentation in which they all stand within the room and can be viewed from all sides is not feasible due to the spatial conditions. Not to mention the fact that such a presentation would require far more effort in terms of appropriate lighting, and that escape routes would also be an issue. In the case of porcelain in particular, relevant information can be found in places that are not usually visible, namely on the underside. The manufacturer's mark and the historical inventory number are inscribed here, exactly on the surface on which the object is usually placed. In addition, most 3D viewers make it possible to annotate certain points of interest, giving us one of those layers of depth that we would otherwise have to remove from the view of the object or its digitized version by using catalogs or wall texts.

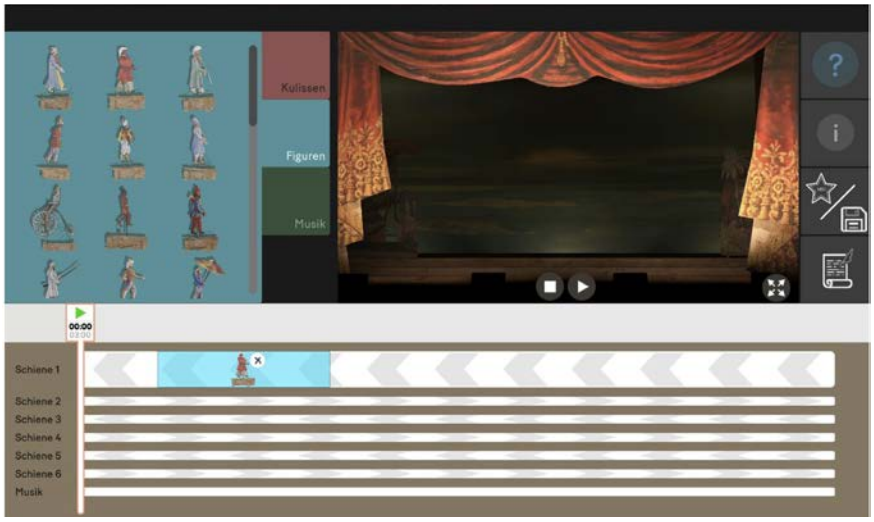
However, the possibilities of interaction go far beyond such mechanisms. After all, many of the objects in our collections were not produced solely for the sake of their reception, but at some point, fulfilled purposes that went beyond their mere display. The historical apparatuses of the Mathematical-Physical Salon, for example, may also be spectacular to look at, but their genius goes far beyond that. They not only represent the power of baroque sovereigns to empower themselves with the principles of nature, but at some point, they really did function as measuring instruments in a way that today, for conservation reasons, we can only talk about. In the digital world, however, it is possible to recreate their functionality and, for example, to make the complex mechanisms of historical clockworks work again. Although this requires considerable effort, the potential is clearly there. The Mathematical-Physical Salon has made an initial foray with its *Behind the Stars* app, which illustrates both the historical instruments and the underlying principles of some of their astronomical devices.

The same applies to the Puppentheatersammlung, whose puppets no longer do the very thing for which they were once made: They are no longer operated. However, since the digital is freed from the threat of wear and tear, there is the possibility of at least bringing their virtual doppelgangers back to life. This is a simple and obvious idea, but the way to achieve it is a complex and lengthy process that involves enormous effort, especially when the puppets and their possible movements are complex, as the challenge of digitizing them grows with the complexity of the objects. However, the Puppentheatersammlung has also made an initial foray in this direction and has chosen the Theatrum Mundi for this purpose. This is a form of puppet-theater in which planar figures are moved along rails so that their motion follows fixed paths. The stages also consist of staggered layers so that digitalization is much easier than trying to capture a marionette with the textiles following its motions and bring it to life.

View of the northern East Asia gallery © Porzellansammlung, Staatliche Kunstsammlungen Dresden, Photography by: Lösel



BEHIND THE STARS: Impressions of the *Nocturnal*, *Sundial* and *Celestial Globe* from within the app
© Mathematisch-Physikalischer Salon, Staatliche Kunstsammlungen Dresden



Screenshot of the digitized "Theatrum Mundi" © Puppentheatersammlung, Staatliche Kunstsammlungen Dresden

It does not take much imagination to envision that in the future we could view stars in virtual worlds through the telescopes of the Mathematical-Physical Salon or attend puppet shows on historical stages, at least digitally. However, this will have to be preceded by considerable financial and time expenditure. Like the reality of the state cells of the underlying hardware, the analogue in the digital appears primarily where it proves to be disturbing and obstructive. As we have pointed out, there are more basic options for the digital to enable museum visitors and researchers to do what they cannot do in the analogue world. Creating such opportunities, and to unlock the digital as a sphere of extension of the engagement with the analogue, is what our efforts in the digital are aiming for. At the same time these efforts need to be holding true to the fact that the analogue object is a compression of a lot more than the digital ever could provide. The digital can thus enrich and promote the experience of the auratic by creating a periphery of narratives, perspectives and activities, but in order to have this experience, the auratic object must still be sought out in the space-time of the analogue world: at the museum.

Notes

1 Friedrich Kittler [1992/93], "16. There Is No Software", in *The Truth of the Technological World: Essays on the Genealogy of Presence* (Redwood City: Stanford University Press, 2014), 219-229. https://doi.org/10.1515/9780804792622-016
2 Walter Benjamin [1936], *Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit. Drei Studien zur Kunstsoziologie* (Frankfurt am Main: Edition Suhrkamp 28, 1972), 15.
3 Marshall McLuhan, *Understanding Media: The Extensions of Man* (London and New York: McGraw-Hill, 1964), 7ff. (Remove background highlight).
4 Vgl. Walter Benjamin [1936]: *Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit. Drei Studien zur Kunstsoziologie* (Frankfurt am Main: Edition Suhrkamp 28, 1972), 15.

Jacob Franke is digital curator at the Staatliche Kunstsammlungen Dresden since 2021. After completing his studies in media studies, philosophy and art history at the Friedrich Schiller University in Jena, he worked as a research assistant for the Chair of History and Aesthetics of Media at the Laboratory of Enlightenment research center, and for the Chair of Film Studies with a focus on visual aesthetics at the same university. At the Staatliche Kunstsammlungen Dresden, he is in charge of the platform voices, which aims at expanding exhibition and collection activities into the digital through a variety of formats.

Martin Zavesky studied media computer science at the Technische Universität Dresden from 2001 to 2007. After graduation, he worked as an assistant for the Chair of Media Design. In 2012 he finished his PhD on the perceptual realistic projection of anthropomorphic shapes ("Wahrnehmungsrealistische Projektion anthropomorpher Formen"). In 2015 he started working at the Research and Cooperation Department of Staatliche Kunstsammlungen Dresden and in 2018 he became Digital Strategy Officer of the SKD. Consultation, project coordination and the development of digital projects within the museums are his main tasks.

Holistic Museum Experiences with Augmented Reality

Florian Wiencek

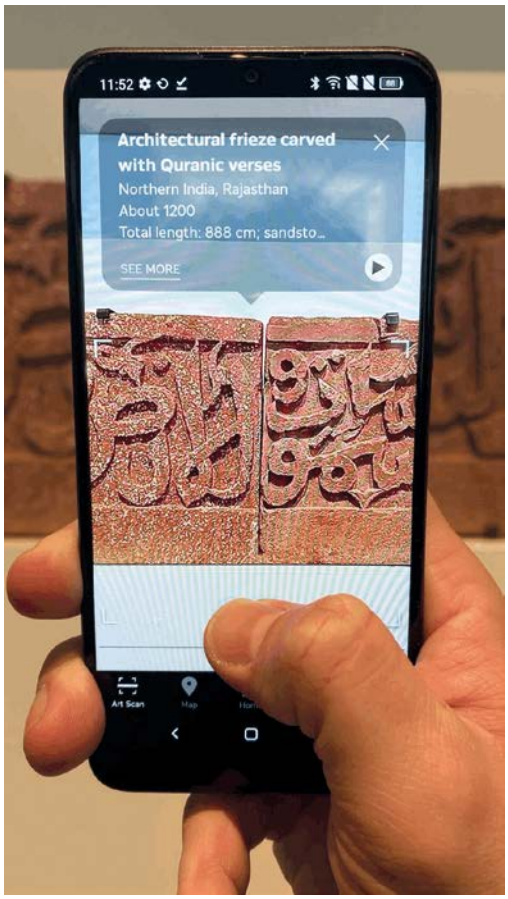
This article reflects on curating and mediating art and culture using Augmented Reality (AR) and its role in creating "holistic museum experiences." The context for this discussion is the concept of paraverse, which is a short form for parallel universe. According to Mersmann and Ohls, this can be a hypothetical universe outside of what we know, and also multiple parallel worlds.[1] This terminology initially suggests a dichotomy of the physical and the digital world or experience, where the digital would exist in parallel with and separated from the physical or non-digital. But does this still hold true when it comes to Augmented Reality as a medium? And what are the unique characteristics and possibilities of this medium for curation, mediation of art and artistic expression?

Augmented Reality is, alongside lifelogging, mirror worlds and virtual worlds, part of the metaverse, which according to Smart, Cascio & Paffendorf is defined "not as virtual space but as junction or nexus of our physical and virtual world."[2] In Augmented Reality, the physical world is technologically enhanced for an individual user by the use of location-aware systems. The interfaces overlay networked information and media (such as visuals or sound) on top of the perception of the world or space around the user.[3] In opposition to the virtual world, which is defined as a simulated world generated entirely by a computer (such as a game world), and where the user is represented and navigating the world as an avatar, Augmented Reality is rooted in the physical world and navigated by physically moving through the space, deeply intertwining physical and digital space. Or, to paraphrase Kit Gilbert from Niantic: "the real world becomes a canvas for XR-experiences."[4]

Niantic is the company that brought Augmented Reality and location-based technologies on mobile devices to the general public's radar in 2016 with their game "Pokémon go," where people could find, catch and train fictitious Pokémon-characters located at "places of interest" in the real world. "Every corner, every street becomes a stage for interaction and magic."[5] Moreover, it is a social game that rewards social interaction and visiting historical sites. With this it follows the mission of Niantic to "inspire people to explore the world together," [6] where technology is employed "to deepen our connection to the world around us and to each other."[7] Besides fostering technological developments in spatial computing, visual positioning systems and augmentation, the game also inspired museums and cultural heritage institutions to take a closer look at Augmented Reality for mediation and visitor experience design. But what does it entail to curate and mediate art and culture in Augmented or Extended Reality? In the following, the article will highlight some examples of strategies using AR in an art and mediation context.

Enabling the exploration of an information space

As a first application, Augmented Reality can be used to explore the information space e.g. of a museum. A great example is the Art Scan feature in the mobile guiding app of the Louvre Abu Dhabi, produced by NOUS.[8] By utilizing computer vision in the form of image and object recognition, the user is able to snap a picture of an object in the museum and access the information space around it — from the rudimentary label information to more in-depth multimedia content. This is a further development of the multimedia guide technology of entering a number or touching a beacon or NFC tag to retrieve information within the walled garden of the application. But now the physical object truly acts as information and content hub. It also fosters the free exploration of an exhibition where further layers of information can be accessed through taking a "photo" or "scanning" the physical exhibition objects themselves on demand, without having to worry too much about the navigation or data structures of a mobile or web-application. The exhibition as information and knowledge structure is enhanced by a digital information layer that is directly linked to the objects.



Artscan Feature in the guiding app of the Louvre Abu Dhabi, 2023. Photograph by Florian Wiencek © Florian Wiencek.

Enhancing / overlaying cultural objects

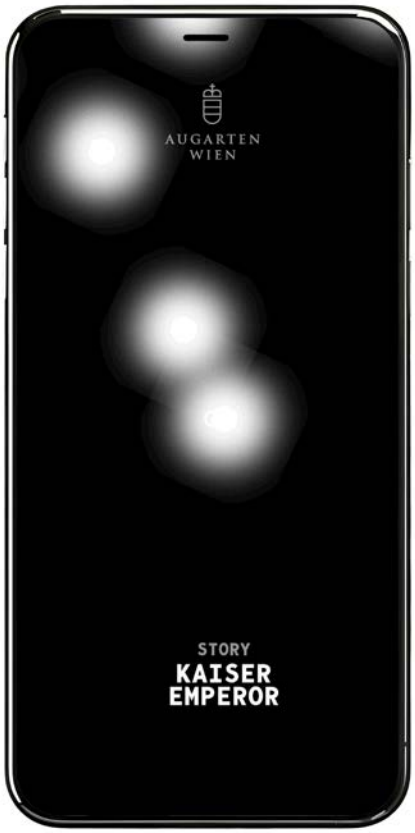
Whereas information access in the example of the Louvre Abu Dhabi is taking place in conventional multimedia guide interfaces, a different approach is represented by enhancing recognized objects inside an exhibition directly in the view of the visitor, e.g. by overlaying and digitally enhancing the cultural object with audiovisual layers, 3D objects or sound on a mobile device, as done by applications such as Artivive.[9] This adds new dimensions of experience to an object, such as bringing it to life or showing hidden layers of a painting, as well as telling stories directly involving the object.

Screenshot of the Artivive overlay over *Bildnis der Frau des Künstlers, Edith Schiele* by Egon Schiele at Belvedere Museum, 2018. Screenshot by Florian Wiencek. Phoneframe by vector_corp on freepik.com. © Florian Wiencek

A good example is the mediation of the Egon Schiele exhibition at the Belvedere Museum in Vienna in 2018. By holding the smartphone in front of the painting *Bildnis der Frau des Künstlers, Edith Schiele* by Egon Schiele, the moving image overlay zooms in and pans over technical images created during a research process on the painting, such as infrared reflectography. These images unveil previous overpainted versions of the portrait showing corrections on the dress of Edith Schiele, which were demanded by the buyer of the painting. This particular story about the painting is told directly in relation to the original artwork, enabling a direct comparison and contrasting of the two versions of the painting. The same application is also used by artists to create digitally extended artworks that go beyond their physical form and include a digital overlay as part of the original work. These hybrid artworks enable the artists to bridge analog and digital forms of visual creation and storytelling in one work. The same technology is used for augmented city tours called "Linz Augmented," where defined features of landmarks, statues, or buildings are used as unique anchor-points for location-based animations, re-imagining historic material from the collections of the state-museum as well as combining them with purpose-created drawings and animation of found elements of the places or their histories. In these three examples the mobile phone or tablet becomes a lens into parallel worlds and acts as a tool for exploring and uncovering ephemeral digital layers of physical objects.

Enabling spatial storytelling & spatial experiences

Augmented Reality can also be used for storytelling and staging in hybrid spaces to create meaningful experiences. One example for this application of AR is the Augarten AR app by Sonic Traces,[10] which utilizes the concept of sound scenography and audio-AR to transform the park in front of the Augarten Porcelain Museum in Vienna into a storyscape. Sound scenography is basically defined as staging spaces and environments through sound to present artistic, historical, scientific content or to establish atmospheres and moods.[11] Sound is utilized to create a sensory and emotional entry point to topics, places and objects. The sonic experiences open up the possibility to immerse the visitor in a story or in other times or spaces. Contrary to a guided audio tour, a story that can be explored by moving through space is not necessarily linear, but consists of narrative and sonic modules that are located at specific points in space or related to specific objects in an exhibition. They can run on a timeline but mostly they are used to be recombined in a non-linear fashion as part of the spatial exploration or the interaction of the user with interactive stations in an exhibition or experience. This is a powerful tool that combines different modes of engagement from simple entering a specific area in space to complex technological interactions with



Screenshot of the AugartenAR app by Sonic Traces, 2024. Screenshot by Florian Wiencek. Phoneframe by vector_corp on freepik.com. © Florian Wiencek

location-based 3D audio, depending of course on the utilized technology or system. The mentioned Augarten AR app opens with a minimalistic interface that, after the calibration of the headphones and language selection, shows mainly a black screen with a positioning marker in the middle while nature sounds are setting a relaxed atmosphere. When coming closer to story-points, larger blurred circles appear on the screen as orientation. When entering a narrow circle by walking into the area in the physical world — determined by a combination of GPS sensors and a visual positioning system utilizing the camera of the phone — the story starts to play. The listeners virtually meet several persons in the park, hearing stories from historic figures, narratives introducing historical facts about the place as well as a series of stories from employees of the nearby Augarten Porcelain Museum and their exhibitions, providing a segway into entering the museum and exploring the galleries. The app utilizes spatial audio in order to provide an auditive sense of space and direction. You can listen to birds above you, hear (and nearly feel) people passing by through their footsteps located relative to your standing position. Together with atmospheric sounds, this heightens the immersion into the scene, place and story, that the visitor becomes virtually a part of.

Where Augarten AR works with a historic space and uses spatial and location-based audio to augment the space with narrative layers, another important aspect of the concept of sound scenography is the close intertwining of spatial sound and scenography or design of the space. A good example of this is the exhibition and installation *Evidence* by the Soundwalk Collective and Patti Smith. The exhibition uses a headphone-based 3D audio system and "takes a sonic dimension, inviting the public to pass through acoustic landscapes: visitors are given headphones that geolocate them in space and react to their movements,"[12] as it is described in the exhibition catalog. The

sound material used in the exhibition for the sonic landscapes stems from the album triptych *Perfect Vision* that was recorded as a collaboration of the Soundwalk Collective with Patti Smith, "in which each of the albums is inspired by the journeys made by Antonin Artaud in Mexico, Arthur Rimbaud in Abyssinia and René Daumal in India,"[13] retracing the footsteps of these poets. The retracing was done literally by the artists through travelling to the places described by the poets, collecting sounds and video materials, as well as reading and researching their work to develop poetic texts and interpretations. The musical and sound compositions, along with the poetic voiceovers by Patti Smith on these albums, were the starting point for the site-specific exhibition that, in a "poetic and immersive quest […] presents sound, film, abstract imagery, objects, and found art collected from their [Soundwalk Collective's] travels, leading the visitor into a large investigative installation that juxtaposes photography, text, and original artworks by Patti Smith," as the exhibition text inside the re-installation in the Museum of Contemporary Art and Architecture Centre (MAC/CCB) in Lisbon in 2024 reads. The main exhibition area is divided into three circular structures with possibilities for sitting around a central sculptural element. Each of the three circles represents the intellectual and story world of one of the three authors, and at the same time, the country they traveled to. When entering the exhibition space, one is immediately drawn into a soundscape of the room. Moving towards the circles, one enters the sonic world of one of the three albums where a story or poem narrated by Patti Smith, combined with experimental music and soundscapes, is placed at each seat within the circle, so that one could either stand or sit down at this place to listen to it. This resembles the concept of a fireplace, where people gather to listen to and exchange stories — and also relates to the cultures of the countries we are virtually visiting in this installation. It becomes evident that the layout and scenography of the room guides the exploration of the visitors through the relation to sound and objects within the space, as it can be learned very quickly and is consistently applied. Through the fire-

Photograph in the exhibition *Evidence* by the Soundwalk Collective and Patti Smith at MAC/CCB in Lisbon. It shows some of the seating circles in the exhibition space. © Photograph by Florian Wiencek.

place-like setup it feels natural to gather in the circles and to sit down to deeply listen to the content, thus supporting a specific way of interaction with the installation. The richness of content —seemingly changing over time when revisiting a spot one has already listened to, or in relation to other media items on display — the installation invites meandering and slowing down, moving physically through the exhibition space and deeply immersing oneself into these sonic and poetic worlds, investigating and uncovering them piece by piece. This highlights the importance of designing the space and the sonic experience together to support each other and to form a coherent and holistic experience. Otherwise, the sound just becomes another redundant layer on top of an exhibition space. Moreover, the location-based headphone system leaves the visual and haptic senses of the visitors open to foster a full immersion into the combination of physical installation, projections and sound as a holistic experience.

Enabling spatial gamification

An additional way to engage users in exploring spaces and cultural learning is gamification. A good example is the newly launched game *The Fantastic Palastics* at Belvedere Museum Vienna, that engages with the history of the UNESCO World Heritage site in a playful way. The goal of this web-based AR-game is to combine the museum's history and educational goals into an engaging experience for children. It is a scavenger-hunt type game, where the players need to find the lost animals of Prince Eugen in the palace garden. About 300 years ago under Prince Eugen of Savoy the garden was one of the earliest zoos in Europe, where the prince collected animals from all over the world. The game begins at one of the stone sculptures at the Upper Belvedere, where a Sphinx statue comes to life and awakens the animals, who lived there for 300 years, from their long hiatus. With the help of the Sphinx's knowledge and a map of the gardens the players need to find all the animals. On their mission they explore the historic gardens and learn about art and culture. "Players search for clues and scan statues to find and collect the garden's lost animals, feeding them as part of their mission. Once all animals are collected, players can take a celebratory photo or selfie with the crea-

Group photo with the Fantastic Palastics in the garden of the Belvedere Museum. Photo: David Payr. © David Payr, Belvedere Wien.

tures amidst the beautiful surroundings of the Palace Garden."[14] The exploration is driven by a fictive story that builds upon the actual history of the site. A reward system and engaging storytelling keeps the motivation up to play and explore further. However, the game in the gardens is maybe only the starting point, as the characters of *The Fantastic Palastics* have the potential to be developed into a full scale ecosystem and can act as drivers for the children's educational program of the Belvedere, according to Peter Meere from The Brand Father:[15] This includes merchandise to take home, and a coloring book solution for the monthly kids magazine of the museum, where children can color a character on paper, scan it on a smart phone, and bring it to life in 3D with AR-technology. The goal is not only to create a game, but to involve the characters outside of the museum and have a positive impact on the lives of the children who engage with them. And as a next step, the group is preparing a concept for a curated AR tour inside the museum with *The Fantastic Palastics*. The goal of this tour will be to unleash the inner creativity of the children, exploring how art resonates with them, as they search for the "secret artist." The team wants to achieve this goal by combining different types of physical and digital exercises utilizing a combination of mobile devices and a physical game map, to minimize the usage of the phone in the museum and concentrate on the art and atmosphere by: a) watching art and introduction videos; b) listen to the characters talking about artworks; c) playing mini games about specific artworks or answering questions about artworks or the architecture in the museum; d) drawing a self-portrait and enable a moment of self-expression.[16] This also highlights the potential beyond the fun factor of a scavenger hunt game to actually lead to a closer engagement with cultural objects and artworks and facilitate a more introspective view on the individual perception of art and the emotions they can elicit. It also emphasizes the fact that thinking about augmentation does not mean to only perceive the world and the museum through the screen of a phone or smart glasses.

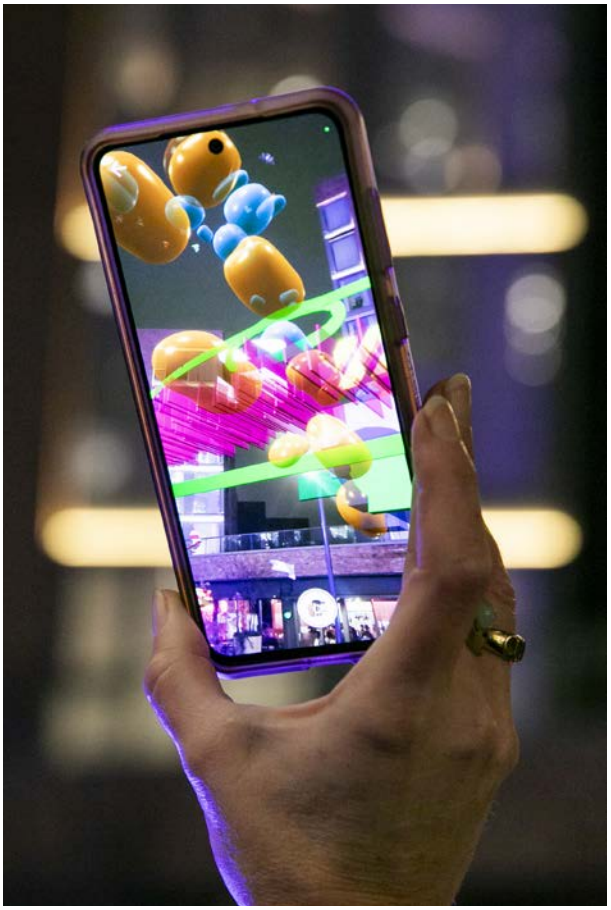
Placing cultural objects in new spatial contexts

One of the earliest concepts of mediating and curating with Augmented Reality is placing (cultural) objects in other spaces or contexts. This allows museums to extend their collection beyond the gallery walls. An early example is ARTours by the Stedelijk Museum in Amsterdam, which consist of a series of prototypes launched while the museum was closed for renovations. One of the prototypes took the museum collection to the Lowlands music festival and established an "ARthotheque" (2010), where festival visitors could borrow artworks from the collection and position them on the grounds of the festival. The festival area therefore became the temporary AR gallery space of a co-curated exhibition. Another prototype was a walk through the city of Amsterdam, where the users were able to experience design objects in meaningful contexts and could learn about the relation of the object and the place.[17] A pattern that is often repeated in such applications is the placement of historic photographs at the places where they were taken, so that they ideally overlay the current view of this location. That way they provide a window into the past of the respective location.

Instead of focusing solely on the recontextualization of natively digital or digitized cultural objects, one can also adopt an artistic strategy or particular style in order to extend the gallery experience to the space outside the building. A great example for this is the exhibition *Maser — Around the Block*, which took place in the RHA Gallery in Dublin, Ireland in 2023. Maser is an artist working between street art, murals and gallery artworks. For the show at the RHA gallery, Imvizar[18] created amongst other elements, an external display on the facade of the gallery that transformed the outside of the building into a canvas for Maser's art. Drawing inspiration from the optical illusions of billboard signs, Imvizar "created 3D animations that echoed Maser's signature

style, incorporating elements of movement, sound, and his distinctive approach to painting. These animations transcended traditional static displays, morphing into animated objects and shapes that moved transiently, engaging viewers in a multi-sensory experience."[19] With this digital extension of the building, they on the one hand paid homage to the artist's roots in street art, making his gallery show expand into the streetscape. On the other hand, the AR billboard provided an engaging experience with his works and artistic strategies and connected with the audience outside the gallery, inviting people inside, where the augmentations continued with a second AR display as part of the exhibition.

Beyond permanently situating cultural objects in contexts outside of their collection institution, Augmented Reality can also be used to place cultural objects in any space around the user. An often-cited example is the BBC Civilisations AR app, which is conceptualized as a companion to a BBC TV series called *Civilisations*, covering a vast number of artworks across human history from 31 countries. The AR application features 40 artefacts submitted by collections from the UK, which fit the themes of the TV series.[20] The artefacts were purposefully 3D-scanned and can virtually be placed anywhere through the app — from a user's living room to a classroom in school. The focus of this application is the interaction with and exploration of these objects as 3D data. One can not only twist and turn all the objects and inspect them closely but also get information through direct annotations, look inside the objects (such as a sarcophagus) through technical imaging, or receive further insights such as translations of



A visitor interacts with a piece of the Hexahedron Exhibition by Imvizar & Maser (2024) outside of the gallery building, that followed the initial exhibit at RHA Gallery in 2023. Photo: Imvizar. © Imvizar.

Annotations and interaction with the Rosetta Stone in the Civilisations AR app by BBC. Screenshot by Florian Wiencek. Phoneframe by vector_corp on freepik.com. © Florian Wiencek

inscriptions, as with the Rosetta Stone. Similar techniques can also be used in group guiding settings, as done in the Humboldt Forum in Berlin, to give the visitors the opportunity to explore objects on display in more depth, instead of just showing flat 2D image slides of details or context. Thus, besides making the objects more accessible to the interested public, this technology is enabling a (rudimentary) hands-on experience and meaningful interaction with objects that under normal circumstances could not be touched inside a museum. This provides an experience that goes beyond what is possible in a traditional exhibition setting.

Summary

The article showed examples for five strategies of using Augmented Reality for curating or mediating art and culture:

Exploration of an information space turns cultural objects into information hubs but can also act as catalyst and anchor point for dialogues between visitors and other stakeholders.

Enhancing or overlaying cultural artifacts result in the emergence of extended artworks or hybrid artforms. Technical devices such as phones or smart glasses act as a lens into hidden data worlds, stories, objects or creatures invisible to the bare eye.

Spatial storytelling and experiences transform exhibitions as well as public or historical places into stages for immersive stories through a 6-degrees-of-freedom system, where paradigms like sound scenography are used to create holistic experiences bridging the physical and digital world. Users physically interact with stories in space, including moving through virtual sound fields and imaginary data worlds horizontally, but this can also include the z-axis through sitting / lying down or climbing up. This intensifies the embodied experience and exploration of the physical space itself and can transport the visitors to different places or times.

Spatial gamification gives the users tasks and purposes to explore a space and keep engaging with cultural objects and histories of the space. Game creatures can become a brand of their own and serve as a basis for further engaging mediation tools beyond screen-based AR.

Placing cultural objects in new spatial contexts recontextualizes cultural objects or artworks and serves as an outreach tool for cultural institutions. Every place can become a place for learning or meaningful interaction with cultural objects / data.

It becomes clear that Augmented Reality changes the way we perceive and interact with spaces and localized information or cultural data in different spatial contexts. It acts as a bridge between the physical and the digital, where the experiences cannot be conceptualized and designed separately as they are perceived as integrated experience by the visitors. In our post-digital times, the museum and cultural experiences need to approach both distinct types of interfaces — or "in-betweens" bridging cultural objects / data and the visitors — in order to create a holistic experience, instead of thinking of the potentially multiple digital layers within an augmented space as a "parallel universe."

Notes

1 Birgit Mersmann and Hauke Ohls, "ParaVerse — Digitalkulturen des Kuratierens, Ausstellens und Sammelns," last access November 2023, https://www.khi.uni-bonn.de/forschung/veranstaltungsreihen/paraverse.

2 John Smart, Jamais Cascio, and Jerry Paffendorf, "Metaverse Roadmap – Pathways to the 3D Web," metaverseroadmap.org, 2007, 4. http://metaverseroadmap.org/MetaverseRoadmapOverview.pdf.

3 See Smart, Cascio, and Paffendorf, 12.

4 Kit Gilbert, "Making the Real World a Canvas for XR Experiences," October 29, 2024, https://www.youtube.com/watch?v=QcbQtDYnSwU&t=332s.
5 Gilbert, "Making the Real World a Canvas for XR Experiences".
6 Gilbert, "Making the Real World a Canvas for XR Experiences".
7 Gilbert, "Making the Real World a Canvas for XR Experiences".
8 www.nousdigital.com
9 www.artivive.com
10 https://sonictraces.com/
11 See Atelier Brückner, *Scenography / Szenografie - Making Spaces Talk / Narrative Räume* (Stuttgart: avedition, 2010), 209; Janina Poesch, "Hammersnail Sonic Research," *Plot* 10 (March 2014): 104.
12 Chloé Siganos et al., eds., *Evidence: Soundwalk Collective & Patti Smith* (Paris: Centre Pompidou, 2022), 86.
13 Siganos et al., *Evidence*, 86.
14 The Brand Father, "The Fantastic Palastics," 2024, https://thebrandfather.nl/cases/belvedere.
15 Wolfgang Bergmann and Peter Meere, "Play to Learn Gamified Education in Action," 2024, https://www.youtube.com/watch?v=6z3BVgsOvPg.
16 See Bergmann and Meere, "Play to Learn Gamified Education in Action".
17 Margriet Schavemaker et al., "Augmented Reality and the Museum Experience," 2011, https://www.museumsandtheweb.com/mw2011/papers/augmented_reality_and_the_museum_experience.html.
18 www.imvizar.com
19 Imvizar, "Maser—Around The Block | AR Digital Art, RHA Gallery," 2024, https://www.imvizar.com/case-studies/maser-around-the-block.
20 Nick Hanson, "BBC Taster - Civilisations AR," 2020, https://www.bbc.co.uk/taster/pilots/civilisations-ar.

Florian Wiencek (B.Sc. Digital Media, M.A. Mediation of Art and Culture, PhD Visual Studies) is an expert at the interface of digital media and cultural education. He is the founder and CEO of Musealisten — Studio for digital mediation, and consults museums and cultural institutions with regard to digital mediation and learning from concept to implementation. Moreover, Wiencek develops sound experiences for the museum as well as public spaces as part of the Initiative for Sound Scenography (in collaboration with Extraplan) and works as media composer and sound artist, creating multi-layered sonic spaces. At LIT Open Innovation Center of the Johannes Kepler University Linz he coordinates the Interreg project "KreATivita&InovaCZe", networking creative industries, research and industry in Upper Austria and Southern Bohemia.
At Fluxguide, he was previously responsible for Digital Concepts and R&D and designed digital mediation and learning opportunities for museums and cultural institutions, including the Deutsches Museum, the Deutsches Bergbaumuseum Bochum, the Württemberg State Museum and the Arvo Pärt Center. At the Austrian Center for Digital Humanities & Cultural Heritage, he worked in the field of knowledge transfer and headed the CLARIAH-AT working group "Tools & Methods." Since 2014, Wiencek teaches at the University of Continuing Education Krems and regularly publishes articles on the digital mediation of art. He is particularly interested in the question of how digital media and cultural data (with their specific characteristics), are used in the mediation of art, culture and cultural learning, and how they enable museums to master the challenges of the 21st century.

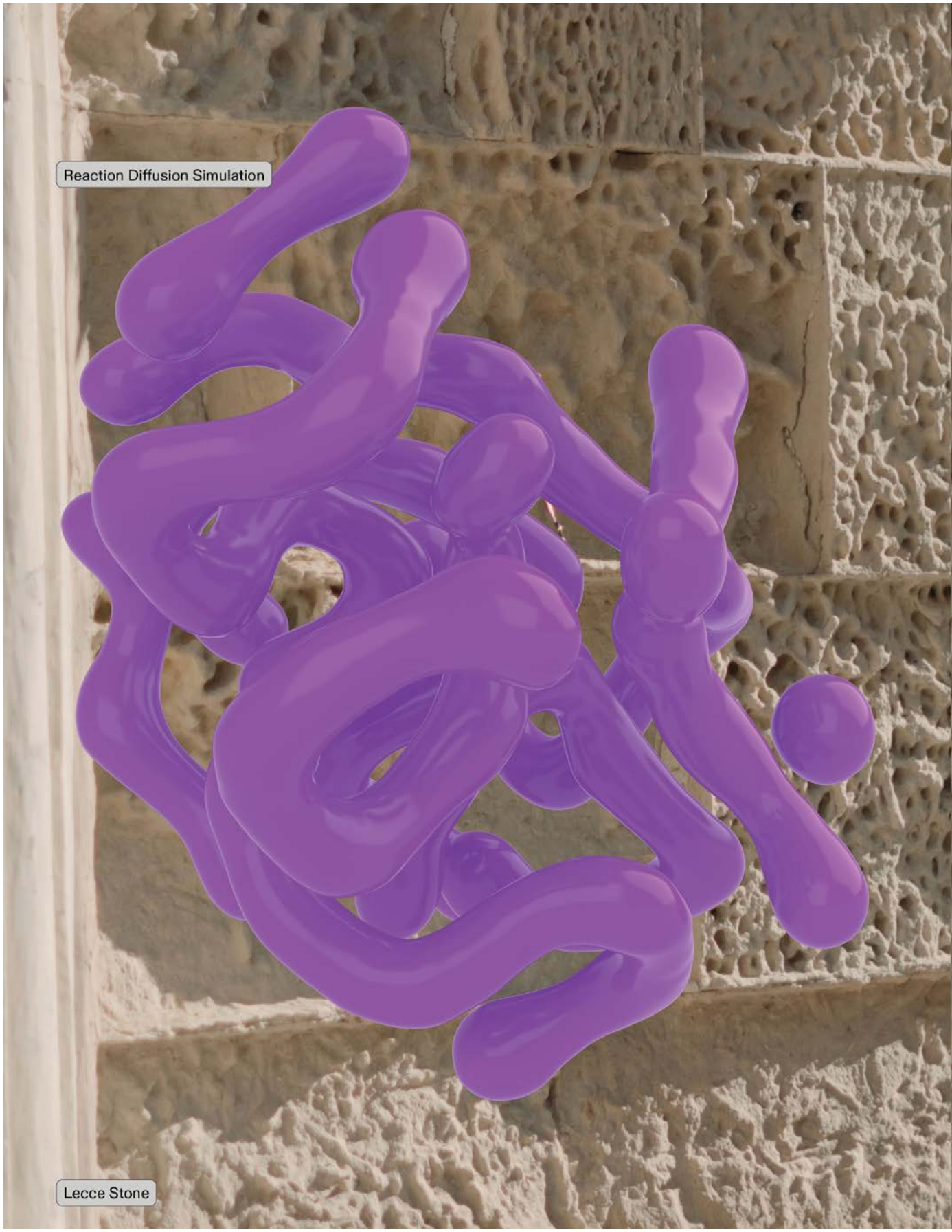
Pietra Leccese. A Visual Essay
Manuel Rossner

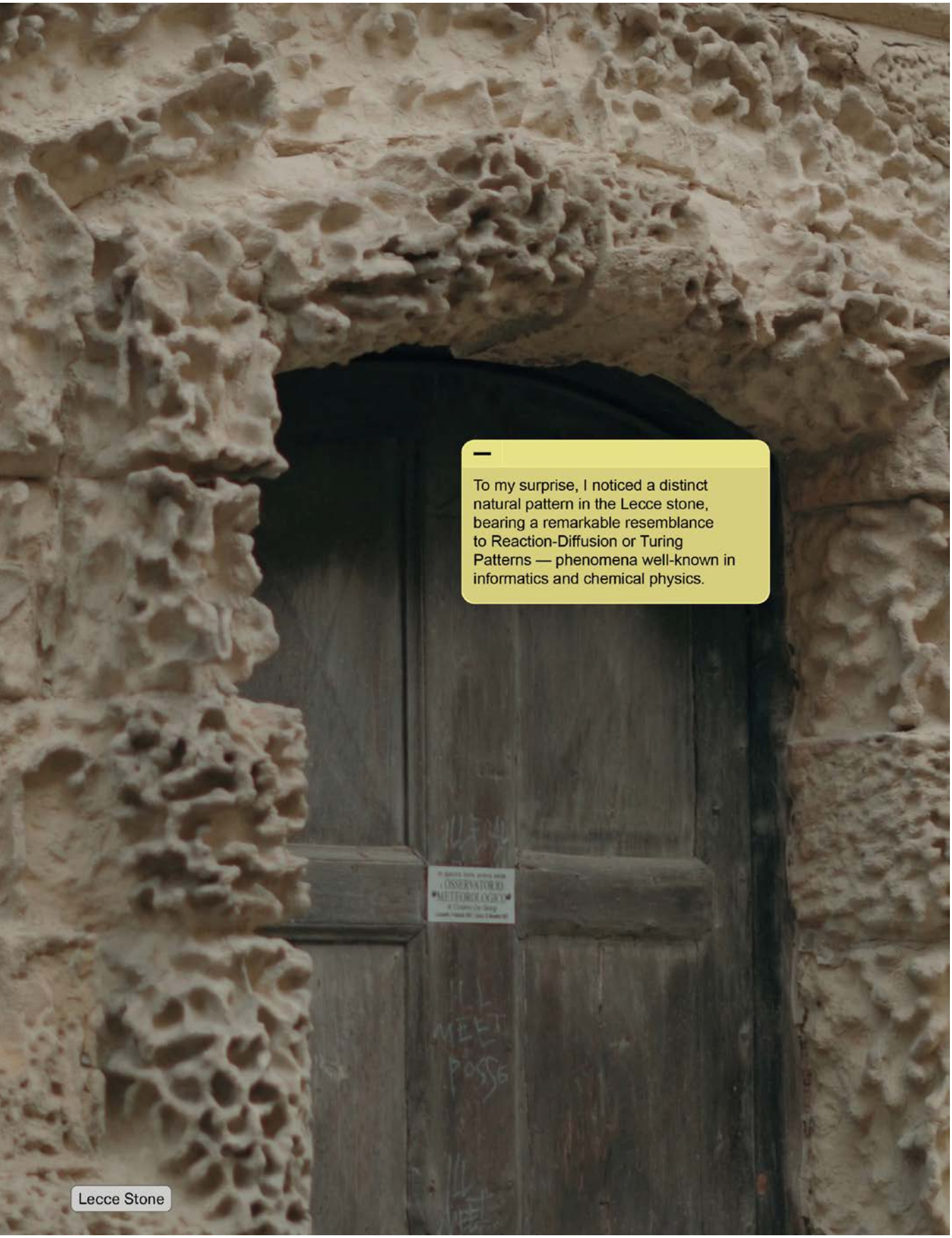
Manuel Rossner lives and works in Berlin. He studied art at the University of Art and Design Offenbach, the École des Arts-Décoratifs Paris and the Tongji College for Design and Innovation Shanghai. Since 2012, Rossner has been designing digital spaces and virtual worlds in which he investigates the effects of technological developments on society and art. He builds interactive architecture with digital materials that are spatial interventions and virtual extensions.

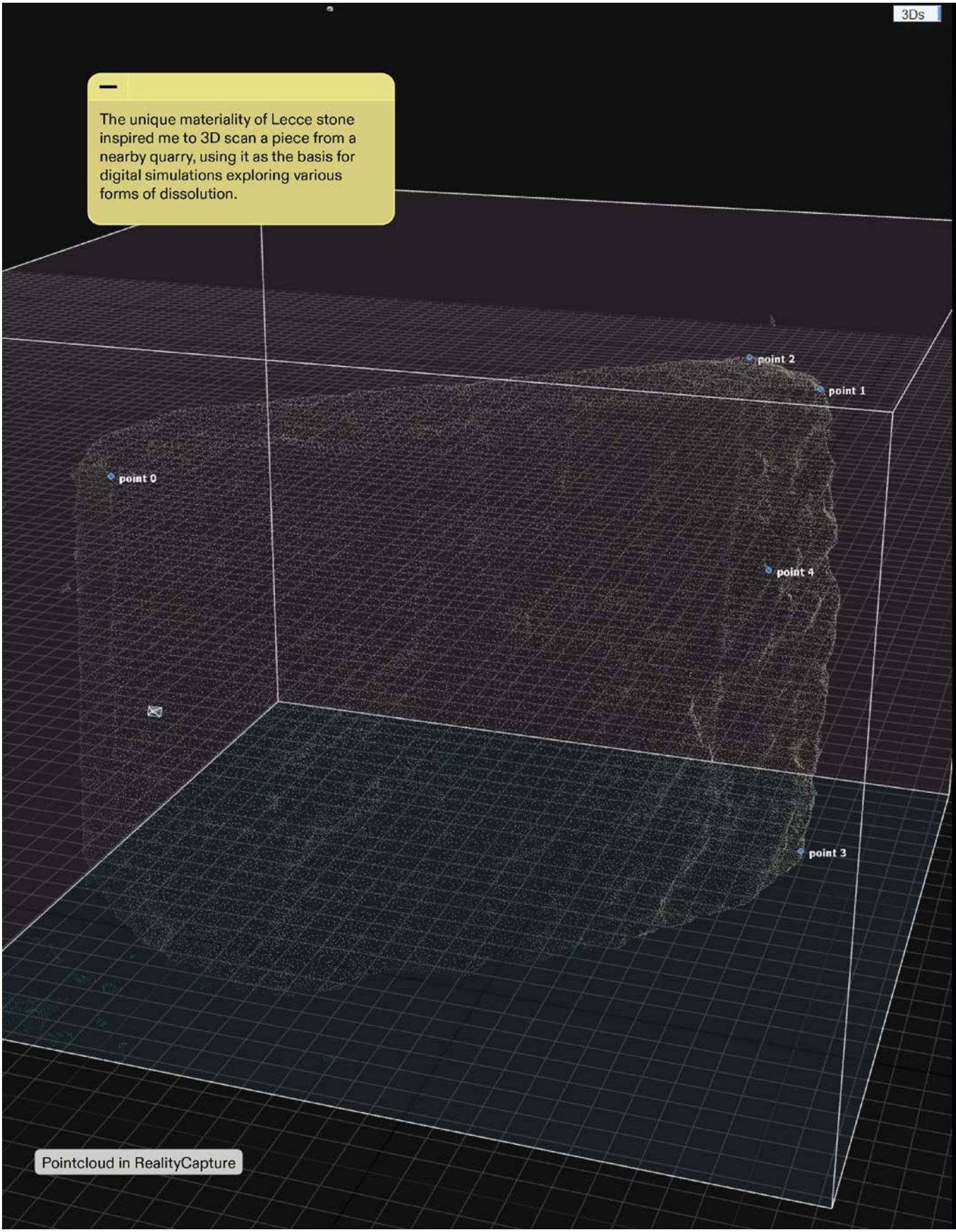

MANUEL ROSSNER
Pietra Leccese
A VISUAL ESSAY

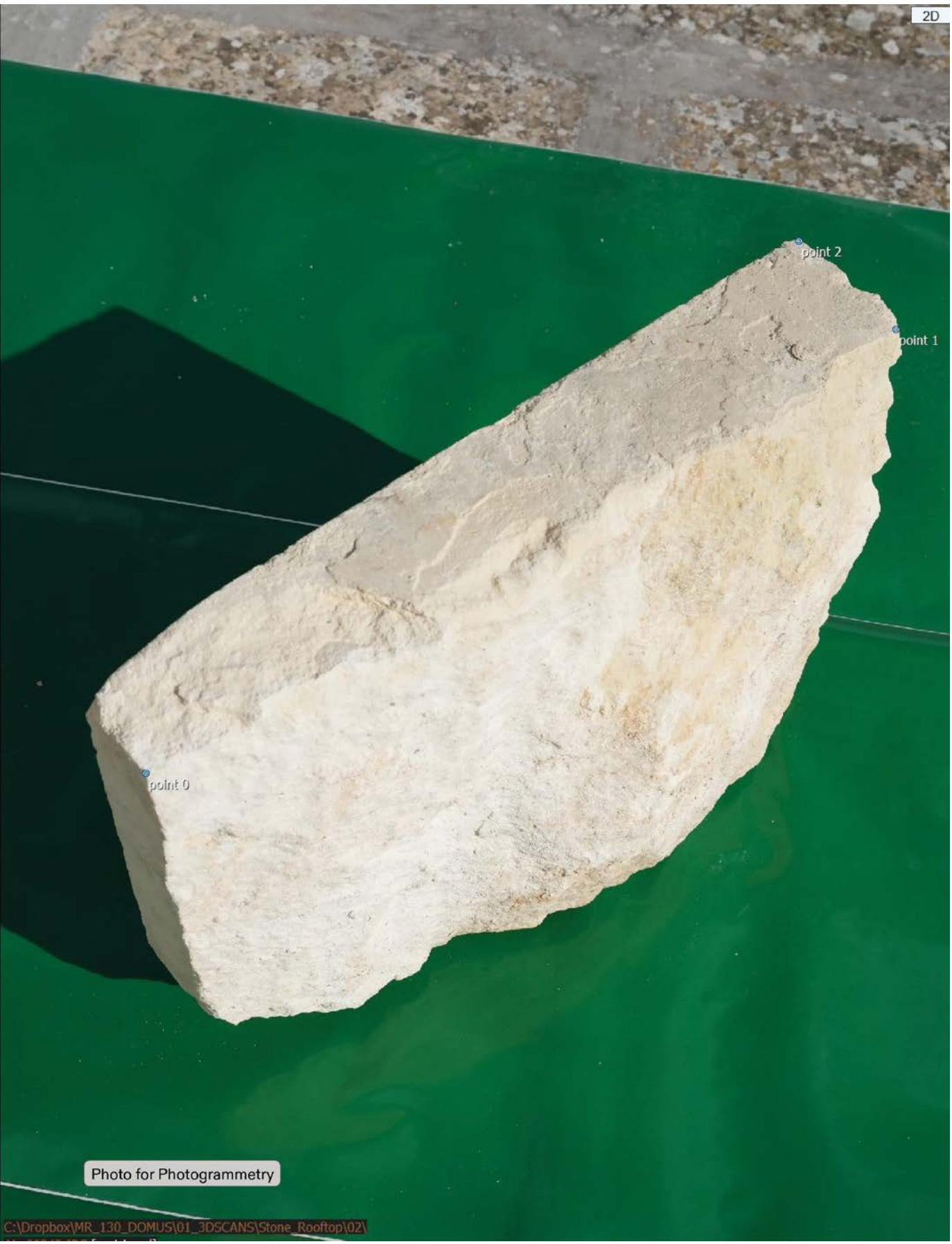
In November 2024, I spent a month at the Domus Artist Residency in Galatina, Southern Italy.

Pietra Leccese, the local limestone, has been cherished for centuries for its relative softness, which makes it perfect for intricate sculptures, stunning facades, and ornamental emblems. However, the same qualities that make it so easy to work with also leave it more susceptible to decay—a characteristic vividly evident in the historic palazzi of the region.

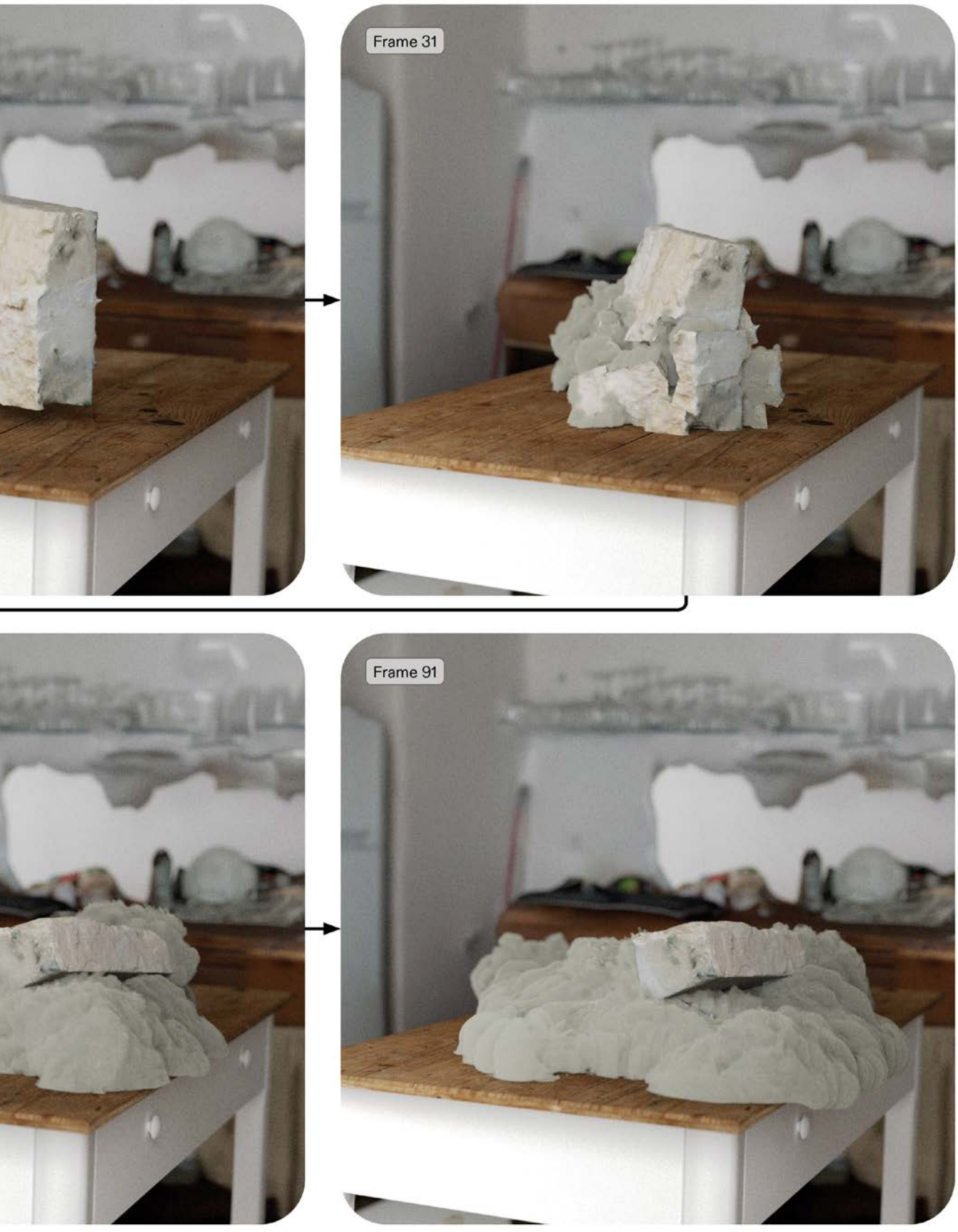

Reaction Diffusion Simulation
Lecce Stone


To my surprise, I noticed a distinct natural pattern in the Lecce stone, bearing a remarkable resemblance to Reaction-Diffusion or Turing Patterns — phenomena well-known in informatics and chemical physics.
Lecce Stone

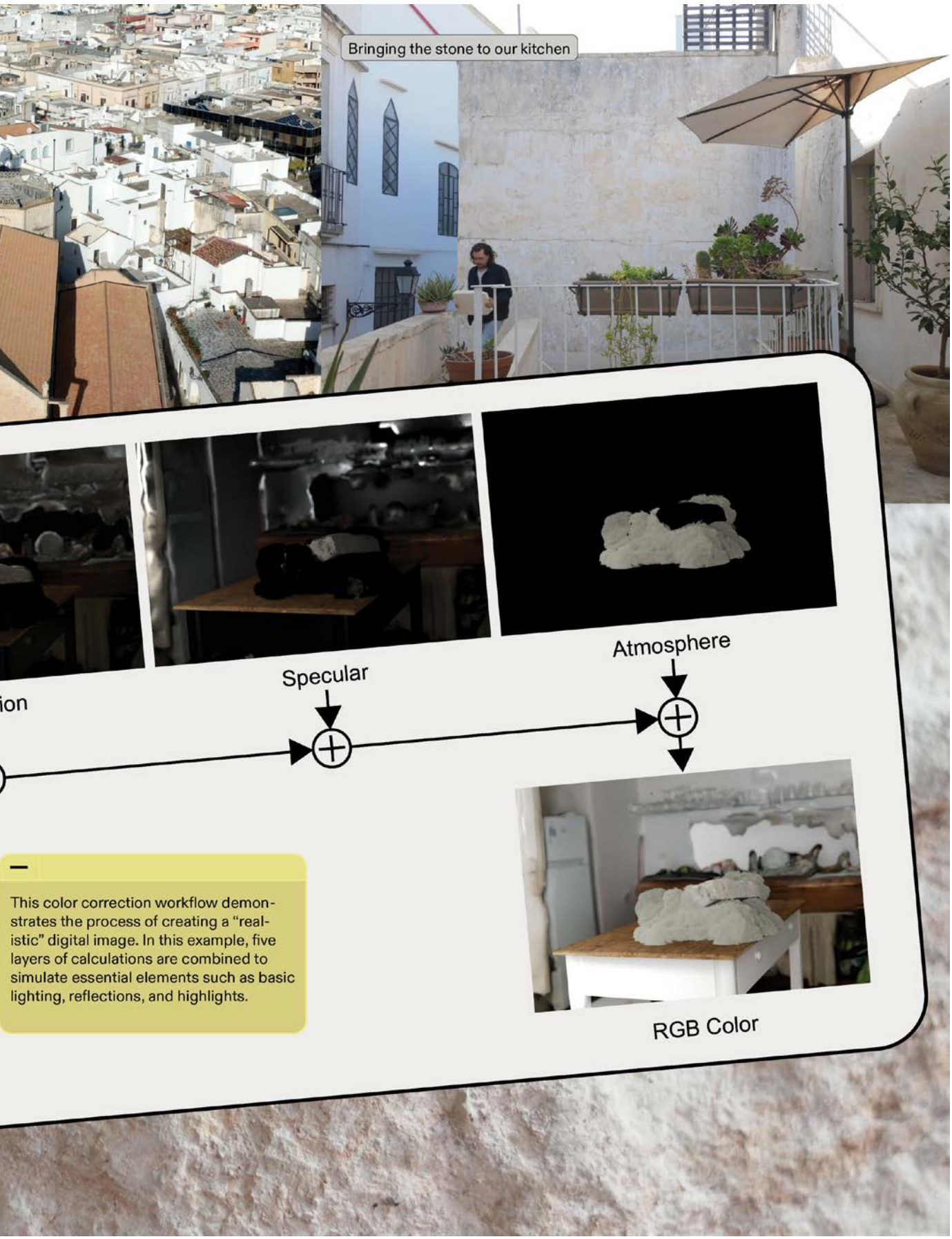

3Ds
The unique materiality of Lecce stone inspired me to 3D scan a piece from a nearby quarry, using it as the basis for digital simulations exploring various forms of dissolution.
point 0
point 1
point 2
point 3
point 4
Pointcloud in RealityCapture


2D
point 2
point 1
point 0
Photo for Photogrammetry
C:\Dropbox\MR_130_DOMUS\01_3DSCANS\Stone_Rooftop\02\


Frame 1
Frame 16
In my initial simulation, the digital stone drops half a meter onto the kitchen table at the Domus Residency.
Upon impact, it shatters into multiple fragments, producing a dust cloud that feels disproportionately intense for the scale of the event.
Frame 61
Frame 76


Frame 31
Frame 91


Basilica di Santa Croce, Lecce
Galatina
Lighting
Global Illumination
Reflecti
Cryptomatte
Sampling Rate



This color correction workflow demonstrates the process of creating a "realistic" digital image. In this example, five layers of calculations are combined to simulate essential elements such as basic lighting, reflections, and highlights.

(Un)Real Worlds of Digital Curating
Dorothee Richter

In order to explore the (un)real worlds of digital curating, I will focus less on different digital possibilities in the narrower field of art but rather try to understand how digital media produce, influence, and situate us as social and political subjects. Since we understand curating as a cultural and political practice and exhibitions as spaces for negotiating various politics, I will build on this to derive proposals for curatorial action.

As Karl Marx's once titled "Die Historizität der menschlichen Sinne" (the historicity of the human senses) proposes, the human senses are historically, if not fully determined, then at least developed in close proximity to the materiality of a society; this simply means that the human imagination evolved as soon as optical devices opened up new ways of seeing. This goes beyond the well-known material bases and the superstructure of ideology. It literally means that the human constitution, the senses, the bodily functions, the possibilities to transfer any input from outside, is developed in close entanglement with material, mechanical, and now digital possibilities.

In the context of curatorial practice, it is essential to discuss this radical upheaval of the epistemic arrangement of body/image/technology and the associated re-situating of subjects and communities. This involves a dissociation of sensual impressions from the body; it is a new form of alienation. From this perspective, too, the traditional mere "hanging", the mere "stringing together" of individual images in a room seems like an almost poignant retrograde act. However, this gesture of pointing is also a statement, an attempt to insist on a world of irreducible distances and ancient media. Connected to this is also the obvious effect of seeing "artworks" primarily as commodities that are and remain transportable and tangible. This conservative, if you will, way of "hanging", usually accompanied by a backward-looking concept of art, is still a widespread curatorial act today. But we must also take into account the possibilities and problematic effects of the digital on cultural techniques such as curating. Therefore, the digital condition today is the (un)real backdrop of contemporary curating.

From Digitalisation to Alienation

But how did we come to this point? This deep alienation, triggered by digitalisation was initiated by the global corona pandemic, which not only provided new images and a previously unimagined dependency of all communication on digital media, but also enabled a new form of governance, a new form of struggle over hegemony. I refer here, for example, to digitally transmitted graphics on the pandemic with corresponding behavioral recommendations, provided by experts and self-proclaimed experts from the conspiracy theory camp. The moment facts and emotionalised images lost their connection, conspiracy ideologies could float freely.: At the same time, the pandemic isolated people, and social contacts were suddenly radically reduced.

In a talk, Johan Hartle argues that the Covid 19 pandemic was a specific aesthetico-political constellation with drastic implications — how the crisis changed our perceptive apparatus, our relationship to the world, and with his analysis, the problem of the fetishization in the arts can be understood.[1] In his view, the crisis was not only a massive crisis in itself in terms of organising social affairs, but it also deepened several

forms of crises: economic crises, political crises, and on top of that, it also somewhat takes away people's capacity to react politically. This dilemma, as Johan Hartle continues, increases the crisis in terms of economic problems, and at the same time it diminishes the capacities to confront the crisis. His argumentation develops the understanding of our current situation in three steps. First, he examines the concept of alienation as developed by Karl Marx; second, he argues the extent to which Georg Lukács' understanding of reification develops this approach; and third, he elaborates on Guy Debord's concept of spectacle as its contemporary extension and what follows for our understanding of the contemporary aesthetico-political constellation. I roughly rely on Hartle's argument and will discuss what implication this ultimately has for curating. He develops the argument in a series of thoughts related to alienation. Alienation is here understood as the term that Karl Marx used to describe the specificity of work in capitalism.

Following Hartle in the fetishism chapter (chapter one of *Capital: A Critique of Political Economy*), it is demonstrated that we keep reproducing social conditions even if we might simply be market agents. We reproduce all implications of a market society: the increasing social inequality and reproduction of social inequality that are implied in the very act of market exchange.

Marx's argument is in some way quite obvious, as Hartle lays out: by exchanging commodities, we reproduce the idea of the exchange of equivalence. This is problematic because there is one commodity that is worth more than it costs, and that is the commodity of labour power. One can buy labour power for its "fair price"; the fair price is the cost of reproduction — historically, not going directly to the producer of new bodies and of care work, (since this would be women's work), labour power is capable of producing worth that is more than what it costs; this is the so-called surplus. By buying labour power and having the labourer produce, the buyer or capitalist gets richer, although he pays the labourer fairly. That is implied in the very act of commodity exchange, because it is implied in the principle of the exchange of equivalence, which is in short Marx's concept of fetishism.

This thought on alienation was further exemplified, as Hartle points out, when the most renowned Marxist cultural critic Georg Lukács wrote *History and Class Consciousness* in 1923. In this book, he develops this idea further and stops speaking about fetishism; he now speaks about reification. Reification means turning social relations or processes into "things". This concept implies that something is turned into a thing that shouldn't normally be treated as a thing. (In German, this sounds even clearer, because it is called *Objektifizierung*). Hartle emphasises that one could say that Marx's understanding of commodity fetishism already implies such a dynamic of turning social relations into things because in the act of exchanging commodities or in the act of thinking there is a necessary value to an object, this commodity has a monetary value. From a feminist perspective, it also means that the relations in the family become objectified, especially as the economic side of a union becomes more and more romanticised. This is typical for ideology, where a narrative or myth in a Barthesian sense confuses the clear vision of what is what. This makes the economic aspects invisible but no less pressing. What Lukács basically says is that, under capitalist circumstances, more often than not, we tend to take processes and relations as what they are not, namely as things. They are being reified, and as Hartle concludes, we do so by acting as individual commodity processors, meaning, we act as individual market agents rather than seeing ourselves as the collective producers of our own lives.

This means, in Hartle's perspective, that we are individual commodity processors who exchange individual commodities — labour power, for example, or whatever we have to sell. But this is a misconception, because the way in which we perceive the world from this angle leads to the misunderstanding that we are confronted with individual objects that we are exchanging as individual agents. Instead, we should see the whole social reality as a process and as a set of relations that we are part of and that we might collectively change. The general understanding is that relations and processes, or society as a whole, now appear to us fragmented, as a set of individual objects and a set of individual agents. This implies that in the neoliberal economy we have a sense of fragmentation and isolation, of being individual market agents, and we have this refined reality of millions of objects in front of us that all seem to restore and contain social reality as an objective fact. When Lukács calls this "reification," he means that the world appears to us as if it was a set of things rather than a set of forces, relations, and dynamics that we ourselves could change. And by being confronted with such a thing as "objective reality," we end up in a "contemplative relationship" with the world: our impression is that we can no longer change this reality; we can only look at it from a certain distanced contemplative point of view.

And this is precisely what Guy Debord develops further in his *Society of the Spectacle* in 1967. Debord also speaks of a world that appears as objectified — but his point is slightly different: we can only approach the objectified reality with which we are contemplatively confronted as passive consumers. The idea of consumption is increased because the world now replicates itself in a world of images, in a world of representations.

In the world of politics, this means that reactions to the emotionalised, unreal world of (fabricated) images are increasingly emerging and taking on concrete forms of public expression. This is partly a reaction to being trapped in distorted doubled images. I cannot go into the problem in detail here, but we see the basic problem as already formulated by Theodor W. Adorno and Max Horkheimer in the *Dialectic of Enlightenment* (1944). The problem here is massive projections into which — precisely without knowledge of the real situations or the real subjects — one's own problems and desires are projected onto substitute subjects that do not actually exist. For this reason, it is not possible to counter racist prejudices with arguments for example; the psychological benefit of such a displacement of one's own wish production is too great.[2] This can be described as an active reaction to a passive contemplative attitude, because it is not oriented towards historical or other knowledge or any kind of differentiated understanding or oriented solution.

NFT— contemplative objectification?

In the world of the arts, the overall digitalisation has other effects. With digitalised artistic works, like NFTs for example, the process of objectivation is increased ad absurdum; unreal digital images primarily serve speculation to which the art market is particularly susceptible, as it is largely unregulated with no ban on insider trading, for example.[3] In November 2021, the price of the digital currency Bitcoin began to plummet, dragging the other major cryptocurrencies down with it. When Russia attacked Ukraine in February 2022, the world changed, share prices collapsed and the appetite for risky investments waned. In the meantime, the cryptocurrency market has lost more than half of its volume. In July 2022, OpenSea, the largest NFT art department store, laid off 20 percent of its staff. The once coveted profile pictures of the *Bored Ape Yacht Club*, an edition of 10,000 computer-generated cartoon monkey faces, are still available to buy. Ape #7827 with earrings, yellow cap and glasses was sold for 8,794

Ether, which was worth 19 million euros at the time. Today, you can buy #7827 for the equivalent of around 172,000 euros. Objects, some of which were sold for many millions at the beginning of the year, have lost an average of 92 percent of their value. Today, the general mood on the market is rather subdued, and in a way the valorisation is now institutionalised. Collectors and artists are meeting on the platform X, and it is a small group of white (fe)male people who form the core of the experts. One of these experts, Anika Meier, explains:

> "You can roughly break it down and say: NFTs are digital certificates of authenticity, and you can see on the blockchain whether, for example, the artwork exists as an edition of ten or whether it is unique and who the artist is. And if it has been sold, in which wallet— that's the name of the wallet in which NFTs are held. This can all be viewed transparently on the blockchain. It is interesting that artists have now started to combine NFTs, i.e. digital works of art, with physical works of art."[4]

As a general rule, NFTs represent a logical development in hyper-capitalism; the works are bought primarily as objects of speculation. From a curatorial perspective, their forms of presentation are often astonishingly conventional and uninteresting; obviously, the reference to the art space, the white cube, must be maintained as a guarantee of ennoblement and value attribution. In order to transfer these rather theoretical considerations on alienation to curating, one can look at the NFT offer of the Belvedere in Vienna as an example, which borders on irony: The Belvedere in Vienna sold imaginary puzzle pieces of Gustav Klimt's painting *The Kiss* (1908–1909). The sale takes place via a website and brought in a large sum for the museum, which suffered huge financial losses during the pandemic. Even if this reinforces the contemplative, passive attitude described in social theory, as buying suggests a kind of participation in decisions, I don't want to condemn this type of financing altogether. On the one hand, museums and art institutions are indeed often underfunded, and on the other hand, it

An example of a NFT gallery on OnCyber. Credit: blog.zenft.xyz

is important for the future of museums to offer something that resembles a game as an entry point. Like other editions, NFTs and other digital works are now often cheaper than regular artistic works. This would suggest a certain democratisation. Nevertheless, it shows a supposed participation that replaces a serious possibility of participation. The museum exists in the struggle for the attention economy and adopts the capitalist logic of exploitation; the real act of buying remains in the unreal/digital, or to put it bluntly, is irrelevant in terms of social, i.e. political influence. Furthermore, the traditional gender relations are also inscribed in the act of purchase in the example of *The Kiss* and also in the clique of experts who constitute the market).

Hyperreality as a third space

As these examples show, to gain a better understanding of the phenomenon of deterritorialised digital images, it is necessary to move away from the dualism of real and unreal.

The hyperreal project in Jean Baudrillard's *Simulacra and Simulation* (1981) questions how the unlimited circulation of images becomes an essential rhythm of postmodernism and foreshadows our (post)digital present.[5] This includes both the circulation of images on social media and the estrangement of images, which are found under the polemical variants like deepfakes and fake news. Digital worlds allow the real and the unreal to coincide and form a third space: the hyperreal. The subject is no longer able to distinguish between the real and the fake, thereby collapsing the concrete, fact-based truth value of information. In distinction to Marshall McLuhan's "the medium is the message," the digital creates its own real worlds with a set of rules.

When Hito Steyerl introduced the "poor image" in 2009, a general critique of the truthfulness of the image began, along with an embrace of the reproduced, often flawed copy-and-paste images that currently flood the meme-driven internet.[6] This makes Steyerl not only politically fruitful but also proves that there can indeed be a real political dimension to these images, namely in their pure "conditions of existence." These exist independently of their origin and the logic of a mission-conscious subject that creates these images. Steyerl examines many more of the effects of images that have a practical and real impact on our present. The essential point is that, although one can assume the unreal origin of an image, one should nevertheless examine its real political implications, uncover them, and thus bring them into the discourse on art.

In his post-Corona crisis essay, Benjamin Bratton asserts unequivocally that crisis situations expose emergency conditions and restore the visibility of reality.[7] Thus, since 2021, a noticeable tendency has emerged to reconnect the immateriality and unreality of the surrounding images with their material conditions during moments when the overwhelming flow of information fails to function "frictionlessly." The moment of disruption, the struggle that Bratton links to the pandemic years, raises questions about the conditions and origins of the digital condition.

Jussi Parikka already expresses this idea in his book *A Geology of Media*, in which he writes: "Data mining might be a leading hype term for our digital age of the moment, but it is enabled only by the sort of mining that we associate with the ground and its ungrounding."[8] Parikka thus made it clear as early as 2015 that the exploitation and destruction of the environment to create digital images can be traced back to a material basis. The immateriality that is so often assumed not only has real impetus, but also has immediate consequences on the physical world. The question therefore arises as to how digital art can be (re)located in curation and art.

Situated and localised curatorial practices

A critical curatorial approach now seeks to counteract contemplative objectification, i.e., a passive attitude toward the world, as intensified by digital art, through active participation, critique, and speculation. To that end, I have selected digital art projects developed in recent years within the *OnCurating* context. This, in our understanding, aims to re-engage with the physical world in bodies, places, and the political dimensions through which knowledge is generated and experienced.

In a way, we follow a logic of situated knowledge that takes image production and its consequences seriously, making the conditions of artistic production visible and anchoring them in place and time. This may involve, as Parikka suggests, exposing the technological conditions of extraction of nature to the viewer or allowing a performative reconfiguration of the image or artwork through participation and a conscious return to physical space.

Ultimately, the goal is to continually integrate the responsibility of producers, as Donna Haraway proposes, into the viewer's interpretive context: "Also, one cannot relocate to any possible vantage point without being accountable for that movement. Vision is always a question of power to see."[9] Relocation, in our understanding, refers to the linking of knowledge about the systems, conditions, and structures inscribed into the artwork with a call for (self-)reflection among all participants. In this sense, I aim to build upon what we developed in the *Scores* project, as described in *OnCurating Issue 53*, and expand this logic to post-digital formats — toward what we call a political form of thinking, one not rooted in representational power but in activation and reflection. This approach strives to create empathy, cultural exchange, and relationality.[10] In sum, recent theory across media and curatorial studies converges on the idea that placing art and audiences back "on the ground"— literally and metaphorically — is necessary to counteract the pitfalls of digital placelessness. Relocation provides the friction, context, and shared space needed for deeper participation and critical insight.

Three projects in particular exemplify how curatorial work can enable this relocation of subjects and artworks: *Are We All Here? Exploring Embodied Virtuality Today* (2021), *Small Projects for Coming Communities*"(2019-ongoing), and *Attention Is All I Need.* (2025) Each of these initiatives responds to digital placelessness by creating experiences that physically or contextually anchor participants through participation, critique, or engagement with shared material environments.

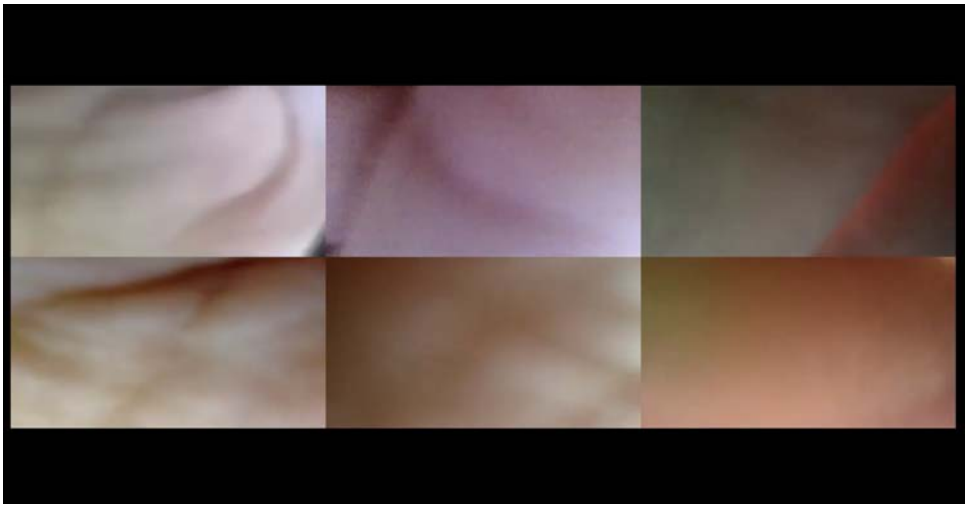
Are We All Here? Exploring Embodied Virtuality Today

At the OnCurating Project Space, we presented early net art in the exhibition *Are We All Here?* (2021). The exhibition focused on the central themes of the contradictions between presence and absence, as well as passivity and participation. One example is Eduardo Kac's work *Teleporting an Unknown State* (1994–1996, adapted 2021), in which light can (and must) be sent digitally to a plant; the light always corresponds to the light of the place from which something is sent. Basically, this is an attempt to counteract the placelessness described by Peter Weibel.[11] This piece involves a live stream and a living plant that grows only by the light of a projection, thus mixing telematics (distant) presence with a tangible, local organism. By staging Kac's work in a concrete room, visitors can walk around the installation, water the plant, or see their bodies juxtaposed with the live video feed. The curators grounded a discussion of virtual connectivity in a physical encounter by reinforcing site-specificity and temporality, treating the online space not as a timeless digital archive but as an event tied to a specific moment and location. For the audience, this was produced by an erosion of the virtual

and the real space. The spectator is visiting a feedback loop, whether online or in person, viewers were prompted to reflect on their own embodied standpoint. The exhibition made "embodied virtuality" tangible and prompted critical questions about online presence and the obsolete nature/culture dichotomy.

We also invited the choreographer Be van Vark to work with the isolated students, who were only connected via Zoom during the Corona Crisis. The result of three workshops with the isolated students, most of whom had never met in a shared real space, was a video; it shows moments of discomfort and intimacy made possible and enforced by digital means. The protagonists reflect on their situation, their fears and isolation while the video is being made. And yet it hints at ways of escaping isolation and relating to each other, through small gestures, through dance, through funny moments. The video ends with close-ups of skin surfaces. In this respect, the video essay on digital intimacy (video *Are We all Here*, 2021, 7:13) addresses (self) isolation, the loss of physical contact and singularisation, and shows an active reflection on this situation, with new ways of relating to each other and exploring the contexts.[12]

Are We all Here?, 2021, Video 7:13, Be van Vark, Students of the MAS in Curating, 2021

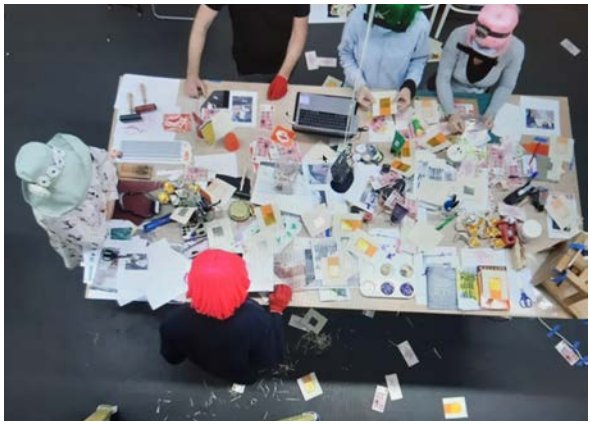


Are We all Here?, 2021, Video 7:13, Be van Vark, Students of the MAS in Curating, 2021

Exhibition view, *Are We All Here?,* OnCurating Project Space, Zurich, 2021

Are We All Here?, Eduardo Kac's work *Teleporting an Unknown State,* 1994 –1996, adapted 2021

Small Projects for Coming Communities, here at ARKO, Seoul, 2024



Small Projects for Coming Communities, here: online, collaboration with Martin Guinard and the 12th Taipei Biennial Rethinks Globalisation, 2021

Small Projects for Coming Communities

A turn toward performative formats can also be observed in digital practice — one that emphasises liveness and shared presence between audience and performers. A compelling attempt to resist digital delocalisation was launched during the Covid-19 pandemic: *Small Projects for Coming Communities*.[13]

This project operated in virtual space but adapted to each context by incorporating local positions. Together with a student group, we invited artists to design scores — short instructions for action inspired by the Fluxus movement. The scores offered a fascinating moment to observe one's body in front of the screen — situated both in an abstract digital space and a real, embodied setting.

We deliberately departed from the institutional white cube and radically opened authorship. The project consisted of diverse scores that allow rethinking the present in terms of collective futures.

One such score by the collective Neue Dringlichkeit, "Future Storytelling," invited participants to imagine a time 50 years from now, when society's problems have been solved, and to look back together, recalling how they achieved that future. This exercise sparked unfamiliar thoughts and joyful strategies. By formulating those visions together, participants no longer saw themselves as isolated, powerless individuals but created a shared room for visionary thinking and inspiration.

This speculative logic can be read as a reference to Roland Meyer's theory of the conjunctive digital image.[14] "Future Storytelling" becomes a reappropriation of the "as-if", transferred into a decidedly analog practice. Imagination and speculation intersect here as forms of relocation. The latest activation of *Small Projects for Coming Communities* happened through a project, an exhibition with ongoing workshops, curated at ARKO in Seoul. As a historical reference the film on Fluxus, *Flux Us Now, Fluxus explored with a camera* was shown. During workshops alongside the exhibition, the scores from the website of *Small Projects* were used to gather and explore new forms of making art in the exhibition space.[15]

Attention Is All I Need

Curated in 2025 by Jonny-Bix Bongers in collaboration with the House of Electronic Arts (HEK) Basel and the OnCurating Academy, *Attention Is All I Need* was an online exhibition that investigated digital self-representation within the logic of today's attention economy. The title echoes the foundational AI paper *Attention Is All You Need*,[16] nodding both to algorithmic mechanisms of visibility and to the human struggle for meaningful focus. The project treated the self as a curatorial site, suggesting that in the digital age, the self becomes a curatorial practice. Through avatars, profiles, and performative personas, the users on the internet engage in the constant, aestheticised labor of online self-curation.[17]

Rather than present this condition as a fixed critique, the curatorial format itself enacted a counter-strategy: by relocating these virtual self-performances into an art context and eventually into physical space, the project reframed identity not as a disembodied abstraction but as a site of shared reflection and discourse. Throughout its online phase, *Attention Is All I Need* activated the web as a live, participatory site. Artists not only contributed deepfakes, 3D avatars, and browser experiments but also

Attention is all I need, online, collaboration with HEK Basel, and students from OnCurating Academy Berlin, 2025

engaged with the students of the OnCurating Academy in three participatory online workshops. For example, Orhun Mersin's remote workshop, "Dragging the Self," invited participants to manipulate their image with deepfake and reflect upon it by engaging with queer feminist theory. Though held online, these workshops emphasised situated action: every participant was somewhere — on a couch, in a kitchen, in their city — performing identity through real gestures and creating video material that was later bricolaged by the artists. The digital, instead of replacing presence, became a portal toward embodied, critical coexistence and collective learning.

By doing that, the exhibition did not treat digitality as neutral ground. Instead, the infrastructure itself became part of the materiality on display. Works like Damjanski's *Sie liebt mich, sie liebt mich nicht* (She loves me, she loves me not) (2023), which exposes algorithmic logics and censorship in a fragile interplay of two chatbots, make visible the constraints within which digital identities circulate. In this sense, *Attention Is All I Need* enacted a reflective interface, encouraging users to slow down and consider how their subjectivity is shaped by visibility metrics and platform norms.

The final gesture of the exhibition — its in-person gathering at DOCK 11 in Berlin — was not an add-on but a pivotal moment of relocation. Despite our initial plan for the exhibition to be entirely online, we could not resist inviting artists and visitors for the exhibition's finale in Saal4 at DOCKdigital. What had been individual navigation(s) across screens, became embodied again in a final coming together that placed the discourses in a mutual, affective, and dialogic setting. In collaboration with the talk series "Realtime Affairs," participating artists, like Allapopp, Carla Streckwall, and Kim Albrecht, held inspiring, rather improvised talks about their work that generated informal conversation and mingling with the audience.

Attention is all I need, collaboration with HEK Basel, and students from OnCurating Academy Berlin, 2025

In this way, *Attention Is All I Need* demonstrated a powerful model for curating digital subjectivity and self-representation. It refused both technophilia and nostalgia, instead building relational bridges between the virtual and the physical in a network of artists, internet users, friends, workshop participants, and collaborators. The exhibition treated online identity as contingent and performative — but also as something that could be grounded, collectively reflected upon, and transformed through communal experience.

Preliminary conclusion

From across *Are We All Here*?, *Small Projects for Coming Communities*, and *Attention Is All I Need*, a shared conviction emerges: that curating in the digital age must involve deliberate acts of relocation and re-contextualisation. This is not a nostalgic return to physicality, but a strategic rebalancing of the real and unreal, shaping and reacting to socio-political contexts. Relocation, then, is not merely a spatial tactic. It is a curatorial practice that insists on friction, presence, and context as antidotes to placeless consumption and disembodied spectacle. These projects illustrate how curators can craft environments — physical, virtual, or hybrid — that allow audiences not just to view or click, but to be somewhere and to reflect from that position.

The displayed exhibitions suggest that yes, there is power in being there, in standing beside others, and in slowing down to inhabit a moment collectively. Whether through a plant that only grows by light sent across networks, a score that asks you to walk barefoot in your apartment, or a livestream that culminates in eye contact across a room.

In an age of ambient distraction, curating relocation is a political gesture. It creates time and space for situated reflection. It acknowledges the erosion and redefinition of spectatorship as participatory co-presence, where the roles of viewer, participant, and co-producer blur. It also opens up speculative zones —"as-if" communities, future imaginaries, temporary assemblies — where alternative modes of being together can be tested.

Notes

1 Johan Hartle, "Corona/Spectacle," Online talk in the MAS in Curating Programme, Zurich University of the Arts, 2 October 2020, see www.curating.org.
2 Theodore Adorno, Max Horkheimer, *Dialectic of Enlightenment. Philosophical Fragments* (Stanford: Stanford University Press, 2002), see chapter on "Elements of Anti-semitism."
3 See translation from the radio feature: *Kryptowelt. Haftstrafen, Schadenersatzforderungen, Imageverluste – die Aufarbeitung geplatzter NFT-Träume hat begonnen* (Crypto World: Prison sentences, claims for damages, loss of reputation—the aftermath of shattered NFT dreams has begun), Deutschlandfunk, "What exactly are NFTs? NFTs are digital identifiers. They are unique, irreplaceable, and cannot be copied. They can be used to mark files such as images, trading cards, music, tweets, or other items. By purchasing an NFT, which is ultimately a type of title deed and certificate of authenticity, you acquire the exclusivity of any digital work. NFTs are therefore attractive to collectors, for example. Prices depend on demand. NFT stands for non-fungible token, i.e., a non-exchangeable object.", 24 August 2023, accessed September 30, 2025, https://www.deutschlandfunk.de/haftstrafen-schadenersatzforderungen-imageverluste-die-aufarbeitung-geplatzter-nft-traeume-hat-begon-100.html
4 Anika Meier in a talk at the OnCurating Academy, venue Radialsystem Berlin, 6 December 2024.

5 Jean Baudrillard, *Simulacra and Simulation* (Ann Arbor: University of Michigan Press, 1994).
6 Hito Steyerl, "In Defense of the Poor Image," *e-flux journal 10*, November 2009, https://www.e-flux.com/journal/10/61362/in-defense-of-the-poor-image.
7 Benjamin H. Bratton, *The Revenge of the Real: Politics for a Post-Pandemic World* (London: Verso Books, 2021).
8 Jussi Parikka, A Geology of Media (Minneapolis, London: University of Minnesota Press 2015), 58.
9 Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." *Philosophical Literary Journal Logos* 32, no. 1 (January 1, 2022): 237–71. https://doi.org/10.22394/0869-5377-2022-1-237-268.
10 "Scores—From Situated Knowledges to Shared Action—ONCURATING," n.d., https://www.on-curating.org/issue-53-reader/scores-from-situated-knowledges-to-shared-action.html#:~:text=We%20see%20this%20project%20therefore,instructions%20on%20exercises%20and%20group.
11 Peter Weibel, "Die Geschichte der Ortlosigkeit und die Entstehung der Ferngesellschaften," Talk in the series *The Iconic Turn*, Felix Burda Memorial Lectures, published on YouTube on 23 August 2012, accessed September 30, 2025, https://www.youtube.com/watch?v=5lIpNADoqYM.
12 *Are We All Here? Exploring Embodied Virtuality Today* was a group exhibition in the OnCurating Project Space. The focal point of the exhibition space was Eduardo Kac's work *Teleporting. An Unknown State* (1994/96), an early interactive biotelematic work that was being reconceptualised for the exhibition in 2021. The installation combines a telematic presence (live streaming webcams) with the planet in the form of a plant that receives light only via the screen. Other forms of participatory work is the film produced with the choreographer van Vark, see Be Van Vark, *Video essay on digital intimacy*, 2021, video, 7:13, see https://www.curating.org/digital-choreography/
13 See https://www.comingcommunities.org/ and "Scores—From Situated Knowledges to Shared Action—ONCURATING," n.d. https://www.on-curating.org/issue-53-reader/scores-from-situated-knowledges-to-shared-action.html#:~:text=We%20see%20this%20project%20therefore,instructions%20on%20exercises%20and%20group.
14 Roland Meyer, Lecture at the *International Festival of Photographic Images 2023*, LVR-LandesMuseum Bonn, 2023, YouTube video, 14:34, https://www.youtube.com/watch?v=ag1k1Ujb7PY&t=874s
15 The project *Into the Rhythm – From Score to Contact Zone* was co-curated by OnCurating (Dorothee Richter, Ronald Kolb,) and ARKO (curator Haena Noh, producer Haebin Lee); artists include Small Projects for Coming Communities, Maya Minder, !Mediengruppe Bitnik with Sakrwoski and Baruch Gottlieb, San Keller, Sohn Younwon, Stirnimann-Stojanovic, Yagwang, Elisabeth Eberle, Yo Daham, Tangerine Collective, Paloma Ayala; collaborations include Green Recipe Lab, Re#sister Korea, Louise the Women, art parenting social club, Piece of Peace, jongdarjung, Eunbeen Ha.
16 Vaswani, Ashish, Noam Shazeer, Niki Parmar, Jakob Uszkoreit, Llion Jones, Aidan N. Gomez, Łukasz Kaiser, and Illia Polosukhin, "Attention Is All You Need," *Advances in Neural Information Processing Systems*, Vol. 30, 2017, 5998-6008. arXiv:1706.03762.
17 Berlin, Dock 11 & Eden. "Attention Is All I Need — DOCK 11.", 30 May 2025, Attention Is All I Need, n.d., https://dock11-berlin.de/en/digital/program/schedule/attention-is-all-i-need#:~:text=Join%20us%20on%20May%2030th,installation%2C%20music%2C%20drinks%2C%20and%20dialogue.

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II. The Digital Exhibition Complex. From Immersive Environments to Market Ecologies

Frameless. Para-Sites of Immersive Art Exhibitions in the Ateliers des Lumières

Birgit Mersmann

Entering an artistically created image as a virtual crossing of the border between art and life has been a vision of art production and a topos of art viewing since the emergence of art. The Chinese legend of the painter Wu Daozi, who disappeared before the emperor's eyes in the large landscape mural he had painted himself, articulates the imaginary desire for a dissolution of the boundary between image, viewer and lived perceptual experience in what is probably the most direct and fantastic way.[1] In his book *Traces*, Ernst Bloch interpreted this particular legend as the appearance of a utopia in the here-and-now.[2]

Immersive art exhibitions, which mushroomed in present-day digital modernity since the market success of the *Imagine Van Gogh* exhibition in 2008, form a new phenomenon in art-exhibition culture. They reflect the ongoing resituating of art history in the era of the digital image.[3] Through digital screening technology, they enable direct, multi-sensory "entry" into individual works of art and narrative art worlds. The immersive audiovisual environment of these art projections ensures that the exhibition viewer/visitor is standing in the middle of the image and can walk through its passage, physically enveloped by the compositional animations of the image flow during this wandering. It is the ubiquity of digitally circulating images in whose environment art history is repositioning and exhibiting itself as a flow of reproductions of canonized images.

Immersive digital exhibitions (IDE), as Nikita Mathias has defined the new type of blockbuster art exhibitions that live from "meta-artistic immersion,"[4] create an intense perceptual experience and receptive attitude in physical exhibition sites. They draw upon a strong bodily and multisensory experience of image space, involving the permeation of pictorial and spatial boundaries that even include the architecture of the built exhibition space. The relationship between the viewer and the art world is controlled by a digital egotism[5] of perception, a response to the growing datafication of the self.

The newly created permanent exhibition venues for the immersive, multi-sensory reception of digital (art) image circuits revolve around the themes of framelessness and borderlessness. "Frameless" is the brand name of the largest permanent art space for immersive digital art exhibitions (IDAE)[6] in the United Kingdom to date. It was founded in Marble Arch, London, in 2022 to promote "the area's reputation as a destination for tourism, hospitality and leisure."[7] In a total of four distinctive immersive gallery spaces, choreographed animations of masterpieces by famous artists such as Giovanni Antonio Canal (Canaletto), Paul Cézanne, Salvador Dali, Wassily Kandinsky, Gustav Klimt, Claude Monet, Rembrandt van Rijn, and Vincent van Gogh are presented. By animating visitors to "step inside art,"[8] the art venue redefines framelessness as an experiential immersive breaking-free of art.

Visitors are immersed in the *Light Sculpture* at teamLab Borderless, Azabudai Hills, Minato City, Tokyo, Japan (2024). Photograph by Danny With Love.

The transcendence of boundaries is also the main goal of "teamLab Borderless," a "museum without a map"[9] created by the international art collective teamLab.[10] The first permanent teamLab museum for immersive digital art exhibitions was founded under the name "MORI Building Digital Art Museum" in February 2024 in Tokyo, and a new Digital Art Museum by teamLab Borderless is planned for Hamburg.[11] In addition, further grand IDAEs in Abu Dhabi, Kyoto, Sapporo and Utrecht will be established in the near future.[12]

As the designation suggests, teamLab Borderless enables visitors to immerse their bodies into "borderless art." Groups of artworks are animated in such a way that one continuous art world without borders is formed. The artworks themselves as well as the spaces into which they are projected become permeable membranes open for connecting with the wandering visitors. "Artworks move out of the rooms freely, form connections and relationships with people, communicate with other works, influence and sometimes intermingle with each other, and have the same concept of time as the human body."[13]

The Ateliers des Lumières and their international branches,[14] founded in 2018 in Paris, are similar venues for staging immersive art experiences. Distinct from the teamLab Borderless "museums" who present and market self-created artworks defined predominantly by the visual language of digital abstraction, but in correspondence with the concept of London-based "Frameless," the French Ateliers des Lumières are specialized in showing popular works by master artists of modernity, as proven by the first highly successful IDAE on Gustav Klimt in Paris.

These three representative examples of internationally expanding digital art venues, even partly defined as digital art museums, demonstrate that a completely new investment market for digital immersive exhibitions has emerged over the last decade,

resulting in a new type of digital art viewing and multi-sensory engagement whose comprehensive institutional and art-market analysis has yet to be carried out. Since a comprehensive picture of this fluctuating development cannot be provided in this article, I will limit my elaboration by highlighting some crucial aspects and features of immersive art exhibitions in the Ateliers des Lumières while focusing on the role of para-sites for digital immersive art reception.

Frameless Viewing through the *Image Totale*[15]. Picturing History of the Ateliers des Lumières

The freeing of the image from its frame, as implemented in the digital immersive art exhibitions of the Ateliers des Lumières, goes back to the (currently copyrighted) invention of the *Image Totale* by French journalist, photographer and filmmaker Albert Plécy in 1977. Plécy can be considered an image theorist, although he remained largely undiscovered in visual studies research. During his lifetime, he was called an "homme d'image."[16] He was chief editor of the French magazine *Point de vue—Image du monde* and founder of the *Association des Gens d'images*. A contemporary of Roland Barthes and of other image semiologists interested in photography and film,[17] he sought to establish a universally comprehensible grammar of images. His *Grammaire élémentaire de l'image*, which was published in Paris in 1968,[18] is based on the thesis that every photographic image is fundamentally a composite image; it can be broken down into the smallest discrete units and, on the basis of this analytical decomposition, its generation of meaning and visual message can be made legible. Plécy's concept of *Image Totale* was an attempt to break out of the frame as both defining marker and imprisoning enclosure of the image and enable viewers to look at an open, borderless world of visual representation. On the cover image of his *Grammaire élémentaire de l'image* (edition of 1968), a photo composition by Gérard Blanchet modelled after a photo montage by Plécy himself, the total absorption of the human viewer by the image already manifests. A tiny human figure can be seen in the owl's eye,[19] signaling the consummate entrance into the picture. In Plécy's view, humans perceive reality as an immersive and ever-expanding image environment, and, conversely, this all-encompassing experience is identified with the experience of image worlds as virtual reality: "The real world, which is everywhere, with the sky, the ground, its play of light and shadow, is Image Totale©."[20]

In the abandoned white limestone quarries of the Val d'enfer at the foot of the village of Les Baux-de-Provence in France, Plécy found the suitable spatial environment to test his concept of *Image Totale*. The quarries had already been spotted before as a cineastic site by French filmmaker Jean Cocteau whose final episodes of his film *Le Testament d'Orphée* (1959) were shot therein. With the first immersive "cave" spectacle staged by Plécy in 1977 on the gigantic limestone screens of 4000m^2, the quarries of Les-Baux-de-Provence were renamed into "Cathedral of Images" thereby establishing a direct connection between the scenographic exhibitionary concept of *Image Totale* with the design of the gothic cathedral as a total work of art.[21] Plécy claims that the Cathedral of Images, which works with immersive, audiovisual projection images, is able to create the impression of a synthesis of the arts in just 100 seconds that would have taken the builders of cathedrals centuries to achieve.[22] He therefore locates the future of the *Gesamtkunstwerk* in the age of audiovisual media in the immersive image cathedral. In this respect, it is entirely in keeping with the spirit of Plécy, the inventor of the *Image Totale*, when music from Richard Wagner's operas is heard in the IDAE of Klimt's masterpieces at the Ateliers des Lumières, such as in Paris in 2018 or at the Phoenix des Lumières in Dortmund in 2023.

Cathedral of Images in Les-Beaux-de-Provence, France, northern hall, 2011. Photograph by © Hans Plantinga

Exhibition view of *Gustav Klimt, Gold und Farbe,* 2024, Phoenix des Lumières, Dortmund, Germany
© Culturespaces / Vincent Pinson, https://www.phoenix-lumieres.com/de/gustav-klimt

Founded in 1977, the Cathedral of Images presented an "advanced production of luminous frescoes of automatically changing imagery on the white stone walls from dozens of carousel projectors, with accompanying soundtrack, that enveloped the contours of the walls and the ceiling of the quarry, producing a 3-dimensional vision, and the viewers themselves, being illuminated and integrated into the vividly coloured imagery."[23] The synthesis of the arts targeted by the concept of the total image is expressed in the connection between the visual arts and the surrounding architecture of the quarry, the relief of the wall and the linkage between the dynamically animated visual stills and sound images, which in turn evoke mental images. The *Image Totale*, which encompasses the viewer from all sides of the room, is intended to enable a multimedia, synaesthetic visual experience: "The total image is the sound image, the olfactory or tactile image, it is the appeal to mental images."[24] To achieve this totally absorbing image environment, a technique of topoprojection was developed with the aid of photogrammetry permitting to adapt the projected image to the three-dimensional structure of the built exhibition space and the textural relief of its walls.[25]

The topics for this exhibition spectacle in the Cathedral of Images were diverse; interdisciplinary in terms of media, and designed for universal communication, ranging from art, architecture and film history to global cultural heritage, nature and the cosmos.[26] This broad approach is continued in the IDEs of the Ateliers des Lumières and teamLab Borderless, as explained above. A decisive feature of the *Image Totale* shows was that, in addition to image technicians, music directors were also employed to create an all-inclusive synaesthetic experience. Over the decades, the use of image media and visualization technologies has been renewed, so that a historical development can be seen from the audiovisual systems of slide projection to multimedia systems[27] and computer-controlled image programming. In the realization of *Michel-ange a la Sixtine* (1992-1994), the computer was used for the first time, not only to program the sequence of images in the Cathedral of Images, but also to rework individual images where it seemed necessary. Ethical questions as to whether this was permissible were not (yet) considered, as enthusiasm for the new possibilities of creation and transformation offered by digital image technologies dominated.[28]

The 2008 exhibition *Imagine Van Gogh* brought the Cathedral of Images into the digital age; it can be considered the first digital immersive art exhibition in the sense of the aforementioned characteristics of IDEs. Curated by Annabelle Mauger in collaboration with Julien Baron, the immersive digital art exhibition was a huge success. In 2016, the two founded the company lilililllilil with the express purpose of designing and producing immersive digital exhibitions based on the concept of the *Image Totale* in the legacy of Plécy. They even registered the concept of the *Image Totale* as a trademark and added their signature approach to its exhibition concept: "telling a story by releasing the emotion contained in the works, presented in their authenticity."[29] In 2017, they presented an improved version of the original *Imagine Van Gogh* exhibition (2008) in the Grande Halle de la Villette in Paris. Due to its great success, it toured internationally and reached an audience of millions. Since the format was quickly copied by countless imitators, Mauger and Baron repeatedly emphasized that they had created the "original" immersive art exhibition of Van Gogh based on the protected concept of the *Image Totale*. The website of *Imagine Van Gogh. The Original Immersive Exhibition in Image Totale*©[30] restrains from showing videos while arguing that the framing of the image contradicts the concept of the *Image Totale* as instigated by its inventor Plécy. This is, after all, consistent with the idea of the frameless image and makes it clear that the "authentic" immersive experience of *Image Totale* is only possible on site, in the new cathedrals of digital imagery. Over 30 IDAEs on modern artists designed by the lilililllilil company have toured the world up to now, fulfilling the criterion of transnationally migrating art exhibitions. The most recent development is the design of immersive city exhibitions as virtual visitor promenades through metropolitan spaces of art, architecture and history, such as the newly licensed *Imagine Paris*.[31]

Exhibition Screening in Heritage Para-Sites

Recognizing the enormous commercial potential of immersive exhibitions in the era of the digital image, the French heritage organization Culturespaces, a leading actor in the digital revolution of museums and their exhibition practice, took over the management of the Cathedral of Images in Les-Baux-de-Provence in 2012. The original system of carousel slide projectors was permanently replaced by digital projectors, the newly introduced AMIEX® technology (Art & Music Immersive Experience)[32] was used to perfect the audiovisual experience of total immersion, and new "cultural spaces" for the staging of immersive digital exhibitions were scouted. Culturespaces is a private French company and foundation that takes care of French cultural heritage, including the art sector. Its services cover the direct or partnered global management and development

of existing public and private monuments, museums and art centers, but also the creation and organization of new cultural establishments and exhibition formats, such as multidisciplinary and digital art centers. Founded in 1990 by Bruno Monnier, it has become the fifth most important actor for the promotion of national art, culture, and tourist heritage in France following the Louvre Museum, the Center for National Monuments, the Domaine de Versailles and the Eiffel Tour. "Sharing culture with all audiences"[33] is the credo of the heritage organization, emphasizing social inclusion and barrier-free exhibition design. In 2018, Culturespaces opened the first so-called digital art center, the Atelier des Lumières, in a former 19th century foundry in Paris. Since then, the worldwide expansion of the concept of digital art centers continued up to the present.[34]

The venues selected by Culturespaces for the establishment of new digital art centers around the world are abandoned or non-used facilities with potential heritage status, such as monuments of industrial, theatre, and military culture, but also contemporary commercial buildings such as shopping malls. Referencing the French Lumières brothers as industrial pioneers of photo- and cinematography, Lumières' digital art centers all keep the historical meaning and function of their respective heritage site in the official designation.[35] The former Cathedral of Images in the quarry of Les-Baux-de-Provence was renamed into *Carrières de Lumières* (2018); the digital art center *Bunker des Lumières* (2018) on Cheju Island, South Korea, is located in the command center of a former bunker. Two IDE centers are located in waterfront areas: the *Bassins des Lumières* (2020), the largest digital art center of the world to date, is positioned in the old submarine base of Bordeaux, and *Port de Lumières* (2024) in the HafenCity of Hamburg.

Bassins des Lumières in Bordeaux, France, with memorial in honour of the Spanish Republican prisoners who helped build the submarine base, 2021, Wikipedia Commons

Fabrique des Lumières (2022) is situated in the refurbished site of the Westergasfabriek[36] in Amsterdam (2022), the *Théâtre de Lumières* in a former cabaret in Seoul, and the *Hall des Lumières* in the ancient Emigrant Industrial Savings Bank in New York, Manhattan. With regard to this site-specificity in the naming, the *Infinity des Lumières* (2021) in the Dubai Shopping Mall in the UAE marks an exception from the rule, combining the name of the local partner (Infinity Arts) with the idea of infinite possibilities in digital art creation.

Through the redesign processes, cultural heritage, with its diverse histories, memories, and functionalities, is revitalized. This applies to both the history of the selected cultural sites *and* the history of the arts as presented in the IDEs on-site. From the heritage-entrepreneurial point of view, this is a clear win-win situation. The desolate or abandoned historical monuments/buildings can be conserved, modernized and managed in their main (infra-)structure, and at the same time, they can be transformed into cash cows for the commercial tourist heritage industry on a global scale. The digital art centers of Lumières' legacy can be defined as para-sites in that they live at the expense of the historical monument site that they occupy and by whose physical substance and re-imagined memory they are nurtured.[37] Moreover, they amount to para-sites by surpassing the physical host site, i.e. cross-fading it from within immersive virtual art projections of a digital image future. The exhibition space becomes itself a paraverse, it forms a gateway (also in the literal sense of a visitor's passage) between the physical and the digital world of cultural and sensory experience. By means of dematerialization, objectlessness, and deframing, historical art transcends its original material and cultural historicity and reaches out into the digital-immersive image encounter of the here-and-now.

Digital Image Cathedrals? Exhibitionary and Cultural Significance of the Lumières Digital Art Centers

Is the evolution of digital art centers, such as the permanent formation and global installation of the Lumières centers, revolutionizing how art is conceived and perceived, curated and displayed? The developmental, image-theoretical analysis of immersive digital art exhibitions in the legacy of Plécy's Cathedral of Images has demonstrated that IDEs have evolved as a new tech-centric, specialized exhibition genre[38] propelled by and coopting the industries of digital image creation, design, and consumption. They are driven by the impulse to transcend traditionally established exhibition formats with hierarchical, stationary viewing practices and aim at including the viewer as a moving traveler and moved participant into the audio-visual surround totality of immersive image environments.

Are IDAEs an abusive, even parasitic exhibitionary form? Do they misuse and exploit the high valorization of modern art histories and in particular the original singularity of popular star artists for profit-oriented copycat exhibition-making? Or do they represent an innovative, future-oriented exhibition form ideally suited for the legacy of art history to survive and wield power in times of digital image and net culture where reproduction circuits, memefication, and AI-based art creation increasingly question the original (object) status of art images?

The emergence of IDAEs was discussed controversially and met with strong criticism. Art writer Isabella de Souza voiced her fear that the digital nature of the immersive art exhibition "may dilute the authenticity and intrinsic value of traditional art forms."[39] The main accusation was that the high art of modern masterpieces moved down to the lowlands of popular media and exhibition formats. Artnet critic Kate Brown entitled her article about the Ateliers des Lumières and their inaugural exhibition on Klimt

(2018): "Is This the Future—or the End—of Art? A Selfie-Centric Art Space Opens in Paris With a Show of Klimt Projections."[40] In that same line of argument, IDAEs were criticized as Instagram-friendly art exhibitions, following the trend of Instagram museums. Other critics observed a Disneyfication of art exhibitions and condemned their commercial financial drive.[41]

Contrary to this criticism and skepticism, the founder and president of Culturespaces, Bruno Monnier, believes in the future and educational potential of IDAEs: "People do not learn about culture as they did in the past. The passive observation of works of art is no longer relevant, and I'm convinced that people are increasingly learning about art through this immersive experience and the emotions they generate. The marriage of art and digital technology is, in my opinion, the future of the dissemination of art among future generations, as it is able to reach a younger and wider audience than that of the traditional museums."[42] This statement emphasizes that the Lumières digital art centers seek to distance themselves from conventional visitor and reception behavior, in particular contemplative image viewing and bourgeois-intellectualist mediation via exhibition texts in the classic museum, and are looking for new emotive ways of communicating art and culture to a digital-native audience.[43] The aim is a multisensory, immersive art experience in which the perception of time and space coalesce into a strong sensual presence of the *hic et nunc*. However, the extent to which the passive viewer becomes an active participant, as the Lumières IDAEs strive for or suggest, is not necessarily obvious, especially when one considers the long history of participatory and interactive (media) art as a temporal and argumentative horizon. Against this backdrop, the viewer in the IDAEs, as conceived in the tradition of the *Image Totale*, seems like a passivized viewer who surrenders to the visual violence and exuberant spectacle of the (art) images, their superior power flowing into him from all sides. In short, it is a viewer teeming with perceptual and bodily overwhelmed by the *Big Picture Show*. Of course, this mode of reception can also be read the other way around as emotional activation through artistic visual power. However, it may only partially encourage visitors to think and engage in critical debate. Yet, it stands to reason to speak of active participation insofar as visitors do not stand passively and head-on in front of still or moving images on the wall or in the room, but actively walk through the animated, overlapping art images by moving through the image environment in the physical space. An additional activating effect of the IDAEs is that visitors position themselves within the gigantic digital image machinery and pose with it for selfies, in order to spread their being-in-the-picture via social media. Through this image-activation mode, visitors to the IDAEs become themselves advertising bodies; they perform as both digital egotists and image-branding actors.

Regarding the paraverse of digital art centers in general, parallels can be drawn to the receptive behavior and prosumer configuration in the digital platform economy and society where shared experiences form the currency of commoning and (supposed) democratization. As Steven Miles (2020) has observed, experience is "the new ideological terrain of consumer society,"[44] and the immersive art experiences created by the IDAEs are part of this development. It would be wrong to completely deny the art-historical and cultural educational aspirations of the Lumières IDAEs. As described above, Culturespaces, in addition to protecting, preserving and managing cultural heritage, also pursues a mission of art and cultural education. However, this is designed to be low-threshold, barrier-free and inclusive in the sense of art/exhibitions for everyone, and thus fits into the latest developments in inclusive, radical-democratic museum work and exhibition curating. In order not to disturb the emotionally overwhelming impression of the total-image show, the knowledge-conveying information and text-

based parts about the exhibited artists, as well as the historical significance of the exhibition venue, are largely reduced and visually banished to the extremities, supporting pillars, niches or internal building elements of the main exhibition space.[45]

Could the Ateliers des Lumiéres be categorized as digital art museums due to their (albeit reduced) educational mission, public accessibility, barrier-free approach and inclusion, as well as their establishment as permanent institutions—a term with which, as mentioned above, the teamLab Boderless exhibition institutions, for example, define themselves? Based on the 2023 definition of a museum by ICOM,[46] this must be denied. The Lumières digital art centers do not have their own collection of pictures and objects to preserve, research, interpret and exhibit; they only use copyright-free art images that are available digitally. Its real treasure is the proprietary, innovative audiovisual technology used to present the IDAEs. In contrast to public museums as cultural institutions, Culturespaces is a private sector player that develops and markets profit-oriented, commercial art exhibitions as immersive digital experiences worldwide. It is dedicated to the business idea of capitalizing on the symbolic image capital of art history in an experience-oriented manner. With the step towards digital art screening, it deliberately distances itself from the philosophy and setting of conventional museum exhibitions. Adapting and expanding the concept of the *Gesamtkunstwerk*, the digital art centers of the Lumières type can be considered the cathedrals of the digital image society. They satisfy the human need for visual spectacle, an emotionally moving *Big Picture Show*. Due to their immersive spectatorship, they blend in with the lineage, visual history and viewing culture of panoramas, IMAX film screenings, and planetarium shows; visually overwhelming, they offer "spectacle over substance"[47] and thus take a central position in the history of entertainment and tourism.

Notes

1 On the legend of the painter Wu Daozi see Jhy-Wey Shieh, "Grenze wegen Öffnung geschlossen," in *Zeichen lesen. Lese-Zeichen. Kultursemiotische Vergleiche von Leseweisen in Deutschland und China*, ed. Jürgen Wertheimer, Susanne Gösse (Tübingen: Stauffenburg, 1999), 201–26; about the meaning of the legend of the image as life trace see Birgit Mersmann, "Das Bild als Lebensspur. Grenzauflösung durch Imagination und Animation," in ibid., *Über die Grenzen des Bildes. Kulturelle Differenz und transkulturelle Dynamik im globalen Feld der Kunst* (Bielefeld: transcript, 2021), 59–76.
2 Ernst Bloch, Spuren (Frankfurt a.M.: suhrkamp, 1969), 154–56.
3 Cp. Christiane Kruse, *Welterschaffung—Kunstvernichtung. Kunst in Zeiten der Bilder* (Berlin/Boston: DeGruyter, 2020).
4 Nikita Mathias, "Meta-artistic immersion in digital exhibitions. History—mobilization—spectatorship," *Journal of Aesthetics & Culture*, vol. 14 (2022), https://doi.org/10.1080/20004214.2022.2129160. By the term "meta-artistic immersion" the author means an "immersion into the artist's world".
5 In the da(t)aist git-festo, a manifesto about AI and art published by the Aiiiii Art Center Shanghai, the virtual identity of digos, i.e. digital egos, is characterised as a feature of the datafication of the self. (https://www.aiiiii.com/index.php?m=home&c=Lists&a=index&tid=145) (last access 14 March 2025)
6 Following Nikita Mathias' definition, I propose to specify the art genre of immersive digital art exhibitions by using the acronym IDAE.
7 This statement was made by Kay Buxton, Chief Executive at Marble Arch London BID, https://marble-arch.london/news/frameless-marble-arch/ (last access 4 March 2025)
8 https://frameless.com/ (last access 4 March 2025).
9 https://www.teamlab.art/de/e/tokyo/ (last access 4 March 2025).

10 The art collective teamLab consists of an interdisciplinary group of specialists, including artists, programmers, engineers, CG animators, mathematicians, and architects who collaborate at the intersection of art, science, technology and nature to create a boundless and fluid perceptual relationship between the subject and the world.
11 The opening of the UBS Digital Art Museum by teamLab Borderless in Hamburg is planned for 2026.
12 Depending on the local and environmental context, the immersive teamLab permanent exhibition projects not only focus on art, but also on culture, nature, and heritage in their curation. See, among others, the recent openings of teamLab: Field of Wind, Rain and Sun, Higashiosaka, Osaka (2024); teamLab: Hidden Traces of Rice Terraces, Izura, Ibaraki (2024); and teamLab Borderless Jeddah, Culture Square, Jeddah (2024).
13 https://www.teamlab.art/de/e/tokyo/ (last access 4 March 2025).
14 In the following, as already in the title, I will summarize all digital art venues designed by Culturespaces under the umbrella term "Ateliers des Lumières"— although only the first digital art centre bears this exact name.
15 To mark the invention of this concept by French image theorist and photographer Albert Plécy, I keep the French term "Image Totale".
16 See Albert Plécy, *Hommes d'images*, Arles: Actes Sud 1997. A study of the photography-based image theory in the work of Albert Plécy would merit its own investigation, but it cannot be pursued here.
17 Such as Paul Almasy, Guy Gauthier, and René Lindekens.
18 Albert Plécy, *Grammaire élémentaire de l'image* (Paris: Editions Estienne, 1968).
19 The photography of an owl's eye which Plécy used for his photo montage was taken from François Merlet.
20 Albert Plécy cit. at https://www.lilililllilil.com/en/image-totale. The concept of the *Image Totale* as immersive (audio-)visual environment was inspired by the diapolyecran media installations of Czech scenographer Joseph Svoboda, in particular his work *Polyecran* which was presented to a wider audience at the World Exposition in Montréal in 1967.
21 Cp. Emile Mâle, *Die Gotik. Die französische Kathedrale als Gesamtkunstwerk* (Stuttgart/Zürich: Belser, 1994).
22 Plécy, *Hommes d'images*, 97.
23 Victoria Broackes, Geoffrey Marsh, "The Evolution of 'Immersive' Exhibitions at the V&A Museum, London, 2008-2021", 2023, https://aeaconsulting.com/uploads/1200012/1622639487105/PDF_EVOLUTION_OF_IMMERSIVE_EXHIBTIONS_COMINED_WITH_APPENDIX_02.06.21.pdf.
24 "L'image totale, c'est l'image sonore, l'image olfactive ou tactile, c'est l'appel aux images mentales." Plecy, "Cathédrale Image," 1977, ibid., *Hommes d'images*, 97.
25 For a detailed description of this technical process, see H.W. Müller, "Une nouvelle race d'audiovisuel", 1987, Plécy, Hommes d'images, 102–104.
26 The Cathedral of Images in Les-Baux-de-Provence was opened on 10 April 1977 with the exhibition *Les très riches heures du duc de Berry*, one of the world's most famous and valuable illuminated books. In its opening year 1977, three further shows were presented in the Cathedral of Images: an "Homage to Cocteau", the discoverer of the quarry in Les-Beaux-de-Provence, personally realised by Plécy, a medieval show and an exhibition entitled *Féerie de la mer*, realised in cooperation with the deep-sea diver, photographer and filmmaker Philippe Cousteau. The starting point for the staging of modern French artists was in 1981 with *Van Gogh en pays d'arles*, which provided an immediate regional reference and was continued in 1989 with *Impression de Van Gogh*. After Plécy's untimely death in 1977, following the opening of the first show, the curatorial team has changed over the years.
27 Plécy uses the term multimedia to refer to the magnetophone, CD player, video

disc, magnetoscope, video projector, photo CD, CD-ROM, electronic or motorised animation, computer and infrared. Plécy, *Hommes d'image*, 131.

28 With the exhibition *L'Image, Parole du Monde* (1997), which incorporated Plécy's vision of a universal pictorial semiology, a video projector was used in combination with a slide projector for the first time, and the concept of topographic projection was adapted to the new digital infographic conditions.

29 https://www.lilililillil.com/en/image-totale.

30 https://www.imagine-vangogh.com/.

31 https://www.lilililillil.com/fr/exposition-immersive/imagine-paris.

32 AMIEX is a virtualisation and mapping system for the high-resolution projection of digitised artworks permitting a seamless image projection on large and irregular surfaces. It was designed by French AV specialist Cadmos.

33 "Partager la culture avec tous les public." Cit. in Culturespaces, Dossier de presse, 2023, https://presse.culturespaces.com/culturespaces?lang=eng (last access 15 March 2025).

34 The creative core team already working for the Cathedral of Images in the 1990s with the Venetian Gianfranco Iannuzzi and Renato Gatto is still active in designing the immersive digital exhibitions for the Lumières venues, so there is a continuity in the artistic creation and curation of the total image experience.

35 Except for the first venue of the foundry in Paris; this digital art centre is called Atelier des Lumières.

36 This gas factory was erected in 1885 by the Imperial Continental Gas Association before it was transformed into a cultural space in 1993.

37 Cp. Michel Serres's figuration of the parasite as janus-faced (Michel Serres, *Der Parasit* (Frankfurt a.M.: suhrkamp, 1981), 282f. and 288).

38 See Marianne Foss Mortensen, "Designing immersion exhibits as border-crossing environments," *Museum Management and Curatorship*, vol. 25, no. 3 (2010): 323–36.

39 Isabell de Souza, "The Rise of Digital Art Venus and Immersive Installations," *MyArtBroker*, 16 February 2024, https://www.myartbroker.com/art-and-tech/articles/rise-of-digital-art-venues-immersive-installations (last access 15 March 2025).

40 The article was published on 13 April 2018 at https://news.artnet.com/art-world/atelier-des-lumieres-1264601. (last access 15 March 2025).

41 See Hettie O'Brien, "Immersive exhibitions: the future of art or overpriced theme parks? *The Guardian*, 20 April 2022, https://www.theguardian.com/artanddesign/2022/apr/20/immersive-exhibitions-the-future-of-art-or-overpriced-theme-parks (last access 15 March 2025); YC Chang, "The Rise of Immersive Exhibition. Development, Design, and Disputation," 16 January 2025, https://medium.com/@danaycc/the-rise-of-immersive-exhibition-28b473982d0d (last access 15 March 2025).

42 https://www.engadget.com/2018-05-01-culturespaces-klimt-projection-the-big-picture.html (last access 15 March 2025).

43 Cp. the statement by Michael Couzigou, founder and director of the Atelier des Lumières: It "is an entirely different type of experience from what you would get in a museum… It provokes a strong emotional response. As such, the Atélier has great potential as an educational space. Our priority is to open culture to everyone, and digital art allows this." (Cit. in Tula Giannini, Jonathan P. Bowen, "Rethinking Museum Exhibitions. Merging physical and digital culture—present to future," ibid., *Museums and Digital Culture. New Perspectives and Research* (New York: Springer, 2019), 203.

44 Steve Miles, *Experience Society. How Consumer Capitalism Reinvented Itself* (London: Pluto Press, 2020), 1.

45 There are no catalogues for further reading on the exhibition, and the relevant information on the website is also reduced to a digestible minimum.

46 "A museum is a not-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible herit-

age. Open to the public, accessible and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment, reflection and knowledge sharing." https://icom-deutschland.de/de/component/content/category/31-museumsdefinition.html?Itemid=114 (last access 17 March 2025).
47 Souza, "The Rise of Digital Art Venus and Immersive Installations."

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Beyond Matter. An Inquiry into the Modes of Exhibition Practices in the Virtual Condition

Lívia Nolasco-Rózsás

Beyond Matter. Cultural Heritage on the Verge of Virtual Reality (2019-23) was an international, collaborative, practice-based research project engaged with a contemporary shift in the production and mediation of visual art within institutional frameworks. The context of the project is largely attributable to the rapid development and ubiquitous presence and use of computation and information technology, specifically augmented and virtual reality alongside artificial intelligence.

The shift is seismic and it is leading to a condition that may be summarized as "the virtual." If the postmodern condition was a "crisis of narratives," as Jean-François Lyotard put it,[1] then the virtual condition reveals a crisis of dichotomies. Its analysis suggests that dichotomies are losing their validity: presence and absence, physical and computer-generated, real and simulated. The algorithmically-generated actuality increasingly dominates our reality, intertwines the physical with the virtual, and skews the linearity of time. This has extensive implications for the spatial aspects of the curation and mediation of visual arts, as well as their reception by a public whose affinity for technology is ever-increasing. The museum transmogrifies into a hybrid entity whose geographical location is extended by various digital platforms; instead of one there is a confluence of exhibition spaces, an extended but also porous system of multiple dimensions.

The virtual condition is thus a tendency in cultural spheres toward the interdependence of physical and digital spaces, as well as the coexistence of multiple exhibition temporalities for art's mediation and reception. It is based on an ontological perspective of virtual realism, which considers the virtual to be as real as the physical. It relates to and results from a dynamic genealogy of culture-related general conditions, such as Jean-François Lyotard's postmodern condition (1979), in which the metanarratives that were a quintessential feature of modernism became generally untenable. These include the post-medium condition described two decades later by Rosalind Krauss (1999), or Peter Weibel's post-media condition (2012) as new technologies and tele-communications infiltrating the arts. It overlaps with various other contemporary conditions, such as the digital condition identified by Felix Stalder (2017), the planetary condition by Yuk Hui (2020), and the curatorial condition by Beatrice von Bismarck (2022).[2] The Beyond Matter project scrutinized the virtual condition in art production and mediation by means of practice-based research, resulting in a plurality of media that includes virtual and augmented realities, digital models and digital artworks, presented in a network of computer-based and physical exhibition spaces that generated hybrid experiences.

The creation of generative networked spaces to display art and produce knowledge is not a novelty; it has unfolded hand in hand with the development of computation's ability to visualize simulated or generated spaces that may or may not resemble our observable surroundings and the ways in which we perceive them.

Logo of the project Beyond Matter, 2020. Design by AKU Collective

Throughout the Beyond Matter project, various activities took place as a result of the practice-based research on the virtual condition undertaken by the partner institutions. Through our common endeavor, the partners aimed to produce a "pool of tools"[3] and related knowledge to help arts practitioners, curators, and museum professionals understand the shift described above and then plan and implement best practices. Putting an emphasis on the spatial aspects of art production, curation, and mediation, the project included the digital revival of selected past landmark exhibitions, the curation of new art and archival exhibitions, conferences, artist residency programs, an online platform, and publications. These multiple actions were based on the virtual condition but also reflected on it.

Beyond Matter was led by ZKM | Center for Art and Media Karlsruhe, and the collaborators comprised of researchers and curators at: Aalto University, Espoo; Centre Georges Pompidou, Paris; Ludwig Múzeum – Kortárs Művészeti Múzeum (Ludwig Museum – Museum of Contemporary Art), Budapest; Tallinna Kunstihoone (Tallinn Art Hall); Tirana Art Lab – Center for Contemporary Art; and the associated partners EPFL Pavilions, Lausanne; HAWK – University of Applied Sciences and Arts, Hildesheim, GIM Gesellschaft für Innovative Marktforschung GmbH, Heidelberg and Bio Design Lab at Karlsruhe University of Arts and Design (HfG). These are institutions of varied scales and profiles with a shared interest in the innovative use of digital technologies to reach non-local audiences, to expand their exhibition spaces digitally, and to create hybrid access to the content they wish to mediate. With this project they each ventured into new territory.

At the heart of Beyond Matter was an exploration of the potential harbored in computer-generated exhibition spaces. The key focus areas, examined through an array of approaches, were formed by notions of space and their meaning in the context of artistic and exhibition practice, as well as by perceptions of the reciprocal relationship between computer-generated virtual and physical spaces — and the immersive features in them — from the points of view of all actors of the constellation within an exhibition.[4] This exploration manifested in various ways throughout the projects; for example in the modeling of two historical exhibitions or through inviting artists to elaborate their take on the virtual from diverse angles.

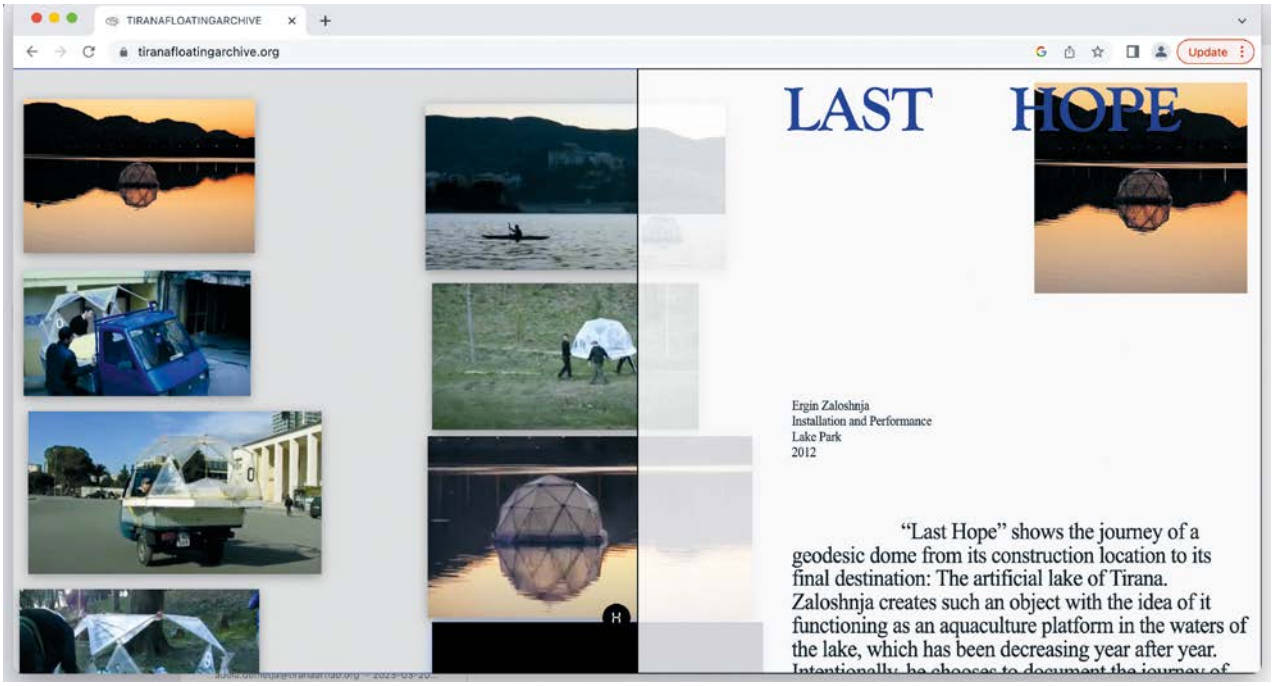
In the context of art production and mediation, the word "virtual" often appears together with "reality." Virtual reality is predominantly understood as a term for computer-aided interactive and immersive environments accessed via screened images and in many cases additional devices (such as head-mounted displays). Dissecting the

term "virtual reality," including its etymology, aids in understanding the condition brought about by the technological opportunity to create relatively sophisticated representations of anything we can perceive and calculate digitally. Indeed, deconstruction serves as a basis for constructing new terms, which in turn serves to contextualize art production and mediation. Donna Haraway came up with an apparently deconstructive yet genuinely constructive method to evolve the abbreviation SF into versatile pairings of words.[5] Generally standing for science fiction, SF was subjected to a word game as Haraway formulated other terms that it could stand for, all of which relate in meaning to science fiction or offer an alternative to it, such as "speculative fabulation" and "string figures." Inspired by how all these new SF terms joined Haraway's arsenal of methodologies, we applied her formula to VR and found that it could stand for a variety of terms beyond virtual reality: viral radiation, valid readings, vaporous restoration, variable relations, visible revision, visionary ramblings, and many more.

The final publication that summarized the project under the title *Beyond Matter. Within Space. Curatorial and Art Mediation Techniques on the Verge of Virtual Reality*[6] took these envelopments of VR as an initial set of points to frame the Beyond Matter endeavor. Each chapter took one enfoldment as its departure point to elaborate on the newly coined term through commissioned essays and descriptions of the outputs of the practice-based research conducted throughout the project, or, in the case of the last chapter, through interviews with the artists and scholars who participated in the Beyond Matter residency program.

The first large-scale exhibition organized in the framework of Beyond Matter: *Spatial Affairs* took place in 2021, in the midst of the Covid-19 pandemic. The various waves of lockdowns made planning of public events, travel, and workflows challenging. Throughout this time art institutions largely relied on online formats. Spatial online art mediation formats had constituted the main focus of Beyond Matter before the pandemic-related lockdowns accelerated this process of digital expansion.

Screenshot of the online exhibition *Spatial Affairs. Worlding – A tér világlása* (2021), https://spatialaffairs.beyondmatter.eu/en. Design and programming by The Rodina. Curated by Giulia Bini and Lívia Nolasco-Rózsás.



Screenshot from the *Tirana Floating Archive* (2022), https://tiranafloatingarchive.org/. Curated by Adela Demetja, design by Denislav Golemanov.

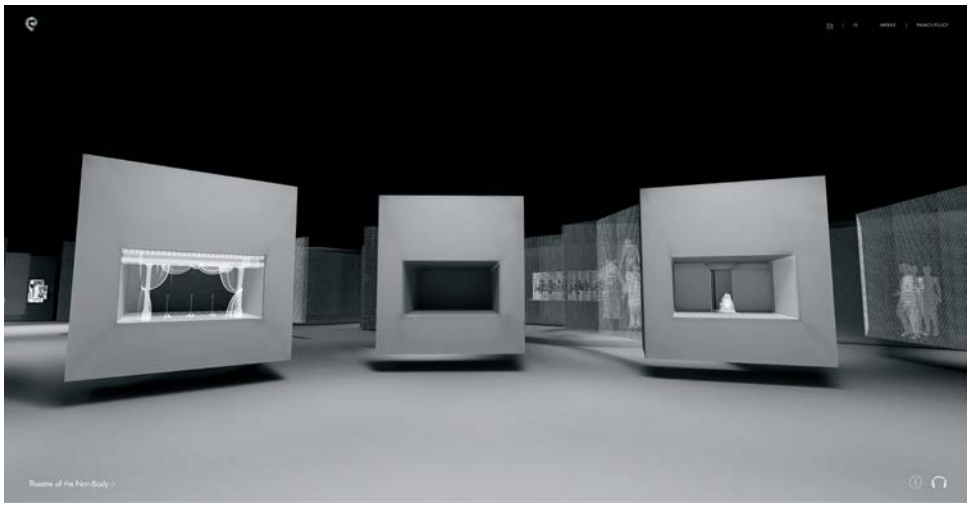
Along with the physical international group show *Spatial Affairs*, presented at Ludwig Museum / Museum of Contemporary Art in Budapest in 2021 and the online environment that enhanced it under the title *Spatial Affairs. Worlding—A tér világlása*[7], the Hybrid Museum Experience Symposium (HyMEx)[8] laid the groundwork for long-term collaborative research regarding the complex dichotomy between the virtual and actual exhibition space. Pre- and post-computational approaches from the interwar avant-garde period through Conceptualism to very recent works of art were selected for *Spatial Affairs*, and they point at the mutual dependence between the algorithmically created and the palpably real. At its conceptual core, the exhibition investigated the binary relationship between the actual and the virtual, the real and the possible, as it evaporates into a multidimensionality in which dualism is undermined, leading to an exploded axes of complex and multiplied notions of space.

Beside *Spatial Affairs*, the *Tirana Floating Archive*[9] was conceived as a virtual space that mediates curated artistic knowledge and aesthetic components unbound from where their physical carrier is actually situated, or where their exhibition takes place. These spaces offer answers to queries about the significance of the space of the exhibition after the post-digital turn, and how art institutions can react to this paradigmatic shift.

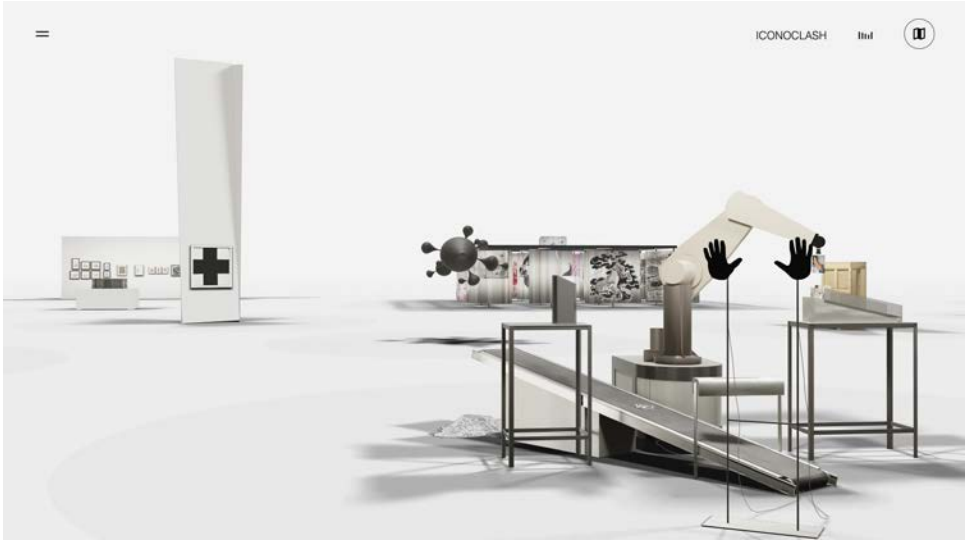
Furthermore, on the verge of the physical and digital was also the traveling exhibition *Matter. Non-Matter. Anti-Matter*[10] with a specific focus on its extended iteration at ZKM | Karlsruhe. Each presentation of this exhibition, varying in size and context, had the same element at its core: *The Immaterial Display*, a hardware installation developed to present digital exhibition spaces. The two digital exhibition models shown in the display engaged with *Iconoclash* and *Les Immatériaux*. Based on those two paradigmatic exhibitions, the exhibition and its accompanying program explored the possibilities of virtual exhibition histories.

Taking up the case studies of *Les Immatériaux* (Centre Pompidou, 1985) and *Iconoclash. Beyond the Image Wars in Science, Religion, and Art* (ZKM | Karlsruhe, 2002), Centre Pompidou and ZKM | Karlsruhe committed themselves to examining the possibilities of exhibition revival through experiential methods of digital and spatial modeling. Both past exhibitions constituted complex thought experiments deployed through and manifested in space. Both also experimented with innovative ways of juxtaposing scientific, technological, and artistic practices. In their respective ways, *Les Immatériaux* and *Iconoclash* proposed the exhibition as both a medium and an interface with a different level of reflection and creativity.

The models were created with a non-physical and non-reconstructive approach, denoted as "Vaporous Restoration" aiming at the emulation, modeling, or proxy-creation of the two selected past spatial assemblies of artworks. These virtual exhibition models[11] are based on extensive archival research, interviews with experts and the



Screenshot *Les Immatériaux: A Virtual Exhibition* (2022) https://lesimmateriaux.beyondmatter.eu/. Concept by the New Media Department of the Musée national d'art moderne—centre de création industrielle, design concept by Aalto University, project management by Matthias Heckel, software development by Netzbewegung GmbH, archival research by Andreas Broeckmann and Marie Vicet.



Screenshot from *Iconoclash as a Digital Experience* (2022), https://iconoclash.beyondmatter.eu/. Concept by Lívia Nolasco-Rózsás, UI / UX and motion design by Matthias Heckel, software development by Netzbewegung GmbH, archival research by Felix Koberstein. © ZKM | Zentrum für Kunst und Medien Karlsruhe

curators, and an iterative design process among a large interdisciplinary group. The chosen exhibitions were well-known, complex, self-reflexive instantiations of the medium that outlined escape routes from modernity while elaborating on notions of representation and materiality. The digital models inevitably prompt the question of whether the aura of an artwork, or even of the entire exhibition, can be migrated into the digital realm.

Inspired by a quote from Walter Benjamin,[12] one of the main objectives of *Matter. Non-Matter. Anti-Matter* was to revisit, restore, and re-present these past exhibitions in our spaces using digital technology. The exhibition presented digital models of the two past exhibitions on *The Immaterial Display*, alongside a novel hardware apparatus that was developed specifically for explorations of virtual exhibitions. The models' online launch took place in conjunction with the exhibition opening on December 2, 2022. A selection of artworks and artifacts attested to art's conceptual dematerialization and digital rematerialization. Some artworks were specially commissioned for the exhibition, while others largely came from the collections of Centre Pompidou and ZKM | Karlsruhe, many of which were exhibited in *Les Immatériaux* or *Iconoclash* or both.[13]

The tension between presence and absence and the digital dissolution of the dichotomy between the two phrased as "Variable Relations" throughout the project, which connotes the multiplicity of connections between visitors, artworks, artifacts, scenographies, curatorial concepts, artists, scholars, museum professionals, objects, and subjects. These new relations across virtual and physical spaces give rise to an epistemological shift that manifests in the *Beyond Matter VIEW Platform*,[14] or in the virtual exhibition platform of Tallinn Art Hall.[15]

Exhibition view of *Matter. Non-Matter. Anti-Matter. Past Exhibitions as Digital Experiences* (2022-2023) at ZKM | Center for Art and Media Karlsruhe. Photo: Esteban Gutierrez Gimenez. © ZKM | Zentrum für Kunst und Medien Karlsruhe

The evaluation methods were part of the project. Performance-oriented research and audience and community studies[16] were conducted and followed *The Immaterial Display* on its journey through Europe, while an evaluation automaton was developed and used to evaluate the digital content and interfaces in a hybrid exhibition qualitatively and quantitatively.

Parallel to practice-based research, Beyond Matter enabled artistic research and creation. A residency program[17] enabled fourteen artists to join one of three participating institutions and ramble—in their minds at least. Due to pandemic travel restrictions, not all resident artists and researchers could be present at the host institution and some had to develop and/or exhibit their residency project online. The *Beyond Matter VIEW Platform* contains the entirely online environments and the online parts of larger projects by some of the artists. Despite these logistical challenges, all the results of the residencies could be exhibited or performed in one or more of the frameworks provided by the Beyond Matter project—in the *Matter. Non-Matter. Anti-Matter* exhibition in Tirana, at ZKM, or as part of the group show *Immerse!* at Tallinn Art Hall.[18]

Beyond Matter entangled and intertwined formats, actions, processes, and results and had a complex project architecture. Each partner contributed a layer of research and was involved with different activities. Beyond Matter has also engendered new content — through exhibitions, symposia, discussions, and publications. It also facilitated professional exchange between art institutions, mainly within European countries, and contributed to cultural professionals' skillsets around digital mediation formats by fostering a transnational mobility of artworks and arts professionals. The project also contributed to the digital commons through digitized archival materials and the development of open-source software that is available online and usable by any other cultural organization wishing to provide online access to the cultural heritage in its guardianship.

A further outcome of the Beyond Matter project is the *Generic Exhibition Platform*. Primarily developed for the digital emulation of *Iconoclash*, it is an AI-based software tool that facilitates the generation of digital exhibition spaces. An exemplary online environment demonstrates the features of the software which seeks to encourage museums, art organizations, and cultural professionals to benefit from the open-source tool for the creation of digital exhibitions of their own. In the interest of the participatory and democratic sharing of resources, the software is freely available on the GitHub account of ZKM | Karlsruhe.

For the creation of a new digital exhibition, digital objects (in the form of digital 3D assets) must be uploaded into the respective Content Management System of the generic exhibition platform, alongside information on the assets (author, title, description, etc.), and keywords. Without the digital objects, the exhibition space is an uninterrupted plane. The space is defined by the objects and the user, and the ever-evolving relation between these two agents.

The algorithm developed for the generic exhibition platform determines the position of the digital 3D objects within the digital exhibition space. The profile of an exhibition piece is described by the values of predefined tags. By observing an exhibition piece over a certain period of time and spending time in its activity zone, the user profile of the visitor is defined. The similarity between all exhibits and the visitor is calculated continuously. The visitor attracts exhibits that share coinciding levels of similarity as their user profile.

As the examples show, the project put forward possible directions for practice-based research and creation in non-academic environments such as art centres, museums, art halls, or art labs in the hope that not only the outcomes but the devised methodologies will prevail, and that art institutions will carry on with digital world-making and create online platforms that function as assemblies, so that hybrid experiences in art mediation will soon be widely accepted, and AI-based construction of digital platforms for sharing knowledge will become ubiquitous.[19]

Tackling the dichotomy between virtual and physical exhibition spaces has been the central tenet of Beyond Matter, directly resonating with the concept behind ParaVerse. The examples and case studies above aptly illustrate a tendency that the project refers to as the formation of a multiverse composed of various parallel universes. The potential existence of computer-generated realities enables such parallelisms, positioning curatorial work as an act of world-building.

This text is a reprint. It is based on the publication Beyond Matter. Within Space. Curatorial and Art Mediation Techniques on the Verge of Virtual Reality*, edited by Lívia Nolasco-Rózsás and Marianne Schädler, Berlin: Hatje Cantz, 2024, (https://withinspace.beyondmatter.eu/) and was published in* Curating Superintelligences: A Reader on AI and Future Curating*, Data browser, vol. 10, edited by Joasia Krysa and Magdalena Tyzlik-Carver, London: Open Humanities Press, 2025. (http://www.data-browser.net; http://www.openhumanitiespress.org/books/series/data-browser/)*

Notes

1 Jean-François Lyotard, *La condition postmoderne: rapport sur le savoir* (Paris: Éditions de Minuit, 1979).
2 These terms reoccur in the texts of the authors, and are elaborated on in the following texts:
Rosalind Krauss, *A Voyage on the North Sea: Art in the Age of the Post-Medium Condition* (London: Thames & Hudson, 1999), 53.
Peter Weibel, "The Post-Media Condition," *Mute*, March 19, 2012, https://www.metamute.org/editorial/lab/post-media-condition.
Felix Stalder, *The Digital Condition* (Cambridge: Polity Press, 2017).
Yuk Hui, "For a Planetary Thinking," *e-flux*, no. 114 (2020), https://www.e-flux.com/journal/114/.
Beatrice von Bismarck, *The Curatorial Condition* (London: Sternberg Press, 2022).
3 The expression "pool of tools" was used by Peter Weibel in the context of the exhibition *Renaissance 3.0* (2023–2024, ZKM | Karlsruhe).
4 The term "constellation" is used here in the sense Beatrice von Bismarck used it in *The Curatorial Condition* (Berlin: Sternberg Press, 2022).
5 See Donna Haraway, *SF: Speculative Fabulation and String Figures / SF: spekulative Fabulation und String-Figuren, So Far, 100 Notes—100 Thoughts / 100 Notizen—100 Gedanken*, documenta (13) (Ostfildern: Hatje Cantz, 2011).
6 Lívia Nolasco-Rózsás, Marianne Schädler, eds., *Beyond Matter, Within Space. Curatorial and Art Mediation Techniques on the Verge of Virtual Reality* (Berlin: Hatje Cantz, 2023). The online version of the book is available open access: https://withinspace.beyondmatter.eu
7 *Spatial Affairs* was curated by Giulia Bini and Lívia Nolasco-Rózsás. The catalog of the exhibition includes texts by Sven Lütticken, Ádám Lovász, Ceci Moss and the curators. Giulia Bini, Lívia Nolasco-Rózsás, Jan Elantkowski, Fruzsina Feigl, Borbála Kálmán, eds., *Spatial Affairs* (Berlin: Hatje Cantz, 2021).

8 The Hymex Symposium was convened by Borbála Kálmán and Lívia Nolasco-Rózsás. The proceedings of the symposium are available online: http://hymex2021.ludwigmuseum.hu/.
9 Adela Demetja, the director of Tirana Art Lab.
10 The exhibition travelled to Tallin Art Hall (2021), Tirana Art Lab (2022), Oodi Library Helsinki, Design Museum Helsinki, Aalto University. Its extended version includes a large selection of artworks based on both past exhibitions that was presented at ZKM | Karlsruhe (2022-2023). Another selection with the focus on *Les Immatériaux* was on display at the Centre Pompidou, Paris (2023-2024)
11 Both can be visited online: https://iconoclash.beyondmatter.eu and https://lesimmateriaux.beyondmatter.eu.
12 "The true method of making things present is to represent them in our space (not to represent ourselves in their space)." Walter Benjamin, *The Arcades Project*, trans. Howard Eiland and Kevin Mc Laughlin (Cambridge, MA: The Bellknapp Press, 1999), 206. First published as *Das Passagen-Werk*, in *Gesammelte Schriften*, vol. 5.1, ed. by Rolf Tiedemann and Hermann Schweppenhäuser (Frankfurt/Main: Suhrkamp, 1982).
13 Creation of the exhibition models was the collaborative effort of many researchers. They couldn't have been realized without the MA Fellowship Program of the Aalto University, coordinated by Cvijeta Miljak.
14 https://beyondmatter.eu/projects
15 https://kunstihoone.virtualexhibition.eu
16 Lily Díaz-Kommonen and Cvijeta Miljak, affiliated with Aalto University conceived and conducted the evaluation.
17 The residency program took place in three institutions: Tallinn Art Hall (curated by Corina Apostol), Tirana Art Lab (curated by Adela Demetja), ZKM | Karlsruhe (coordinated by Felix Koberstein).
18 The exhibition *Immerse!* (2023) was curated by Corina Apostol and Lívia Nolasco-Rózsás. Its catalog was published with texts by Matthew Fuller, Helen Kaplinsky, Lukáš Likavčan, Zsolt Miklósvölgyi, Mário Z. Nemes, and the curators. Corina L. Apostol, Lívia Nolasco-Rózsás, eds., *Immerse!* (Berlin: Hatje Cantz, 2023).
19 This text is largely based on the introduction to the project in the publication *Beyond Matter. Within Space.*

Lívia Nolasco-Rózsás, curator, researcher, and writer, specializes in the intersection of art, media, and information technology. She has collaborated with institutions such as ZKM | Karlsruhe, Chronus Art Center (Shanghai), Nam June Paik Art Center (Yongin), and Ludwig Museum Budapest. Her curatorial work investigates the genealogy and societal impact of planetary computation, electronic surveillance, and the possibilities of the virtual condition. She has conducted extensive research in curatorial studies, particularly on the "virtual condition" and its role in exhibition spaces. From 2019 to 2023, she led the *Beyond Matter* project at ZKM, working with partners such as Centre Pompidou (Paris), Aalto University, and Tallinn Art Hall. She has published widely and recently edited *Beyond Matter, Within Space: Curatorial and Art Mediation Techniques on the Verge of Virtual Reality* (2023). Since 2023, she has been a lecturer in curation and media practice at University College London and serves as a curatorial and research fellow for Paik Replayed at ECAL, Lausanne. As an independent curator, she has collaborated with Giulia Bini on the online platform and traveling exhibition ARE YOU FOR REAL, commissioned by ifa – Institut für Auslandsbeziehungen since 2023, and has convened solo and group exhibitions for the Goethe Institute and Kunsthalle Praha.

Ctrl + Curate: About Online Exhibitions

Peggy Schoenegge

New technologies have not only influenced artistic practice, shaping new forms of art, but have also had an impact on curatorial work. Technological progress enables artists to explore innovative forms of expression that often demand different viewing habits. Consequently, new approaches to exhibition necessitates new modes of presentation. This has been evident with mediums like video and recent immersive technologies such as augmented reality (AR) or virtual reality (VR). In particular, the widespread use of the internet has had a profound impact on the art world, opening up an entirely new space for artists and curators.

The transition to web-based realm opens up a different framework for action. Online art spaces offer possibilities that go far beyond physical or traditional exhibition spaces. The physical is defined by its architectural structure, material interior, and structural aspects like opening hours and entry regulations. Here, the exhibition must conform to the requirements of the venue. In contrast, online spaces are shaped by digital elements such as graphics, animations, or interactive features. These digital components are typically flexible and can be customized to suit the exhibition's needs. The online framework is thus more adaptable, and as a result, it allows for 24/7 global reach, unlimited spatial possibilities, and dynamic content updates. In this environment, online exhibitions promote barrier-free access and direct participation, reaching audiences in their immediate everyday lives on devices such as laptops, tablets, or smartphones. For this reason, as Katarína Rusnáková writes, the internet enables real communication with the audience, based on new forms of discourse such as chat rooms.[1] It offers a democratic approach, enabling projects that deal with the socio-political questions of our time.[2] This accessibility supports a more inclusive art world that embraces current technical advancements. Furthermore, it pushes the boundaries of perception and encourages a rethinking of how art is presented, experienced, and made accessible.

With the widespread accessibility of the internet since the early 1990s, it is finding its way into the art world. Artists and curators use the web as a platform for presenting and distributing art, opening up a web-based space for experience. One of the earliest projects worth mentioning is *The Thing* (1991), founded by Wolfgang Staehle, which served as a forum for the exchange of art and artists. Another notable platform is *Hyper X* (1995), a digital exhibition space for net art, curated by Alt-X in collaboration with other curators such as Mark Amerika, Christiane Paul, and Marisa Olson. Similarly, *Splashback: Rhizome's Splash Pages* (1998–2002) aimed to provide immediate online access to art while simultaneously reflecting the speed of the internet. In addition, whitneybiennial.com presented the works of the 2002 Whitney Biennial digitally as a supplement to the physical art show. Since its founding in 2013, Panther Modern has continuously expanded its virtual exhibition space, allowing for a spatial experience of the artworks. This list can be continued into the present day of Web 3.0; however, it is still very fragmentary.[3]

These early online spaces were often quite experimental and technically limited. They either adapted to or built their own framework on platforms.[4] Such early examples laid the groundwork for what followed in the digital art world. Many of these websites are

no longer accessible and only partially documented, which therefore leaves a large research gap in the field. This also underlines the fact that the internet is a constantly evolving medium, as can be seen in concepts like Web 2.0, Web 3.0, and the metaverse.[5] Websites are generally not permanent. They depend on ever-changing browser technologies as well as providers and maintenance. However, with technical advancements, new opportunities for digital art and online exhibitions continue to emerge—especially with the current development of WebXR[6].

Due to the measures taken during the COVID-19 pandemic and the resulting shift to the internet, not only did numerous online projects emerge again, but their reflection and contextualization also gained traction. In this context, the discourse has primarily been descriptive, focusing on structural and formal potentials that enhance accessibility and visibility of contemporary art by outlining characteristics of the digital. A media-theoretical approach is often taken, tracing the development of the internet as a whole and the specific development of various platforms and technologies such as VR. Contributions from Francesca Baglietto (2016)[7], David England (2016)[8], Annet Dekker (2021)[9] or Lívia Nolasco-Rózsás with Marianne Schädler (2023)[10], illustrate this development. While the influence of technology is frequently acknowledged, a deeper analysis of the internet as an artistic space remains largely unexplored. This gap, however, presents an opportunity for further investigation and critical engagement.

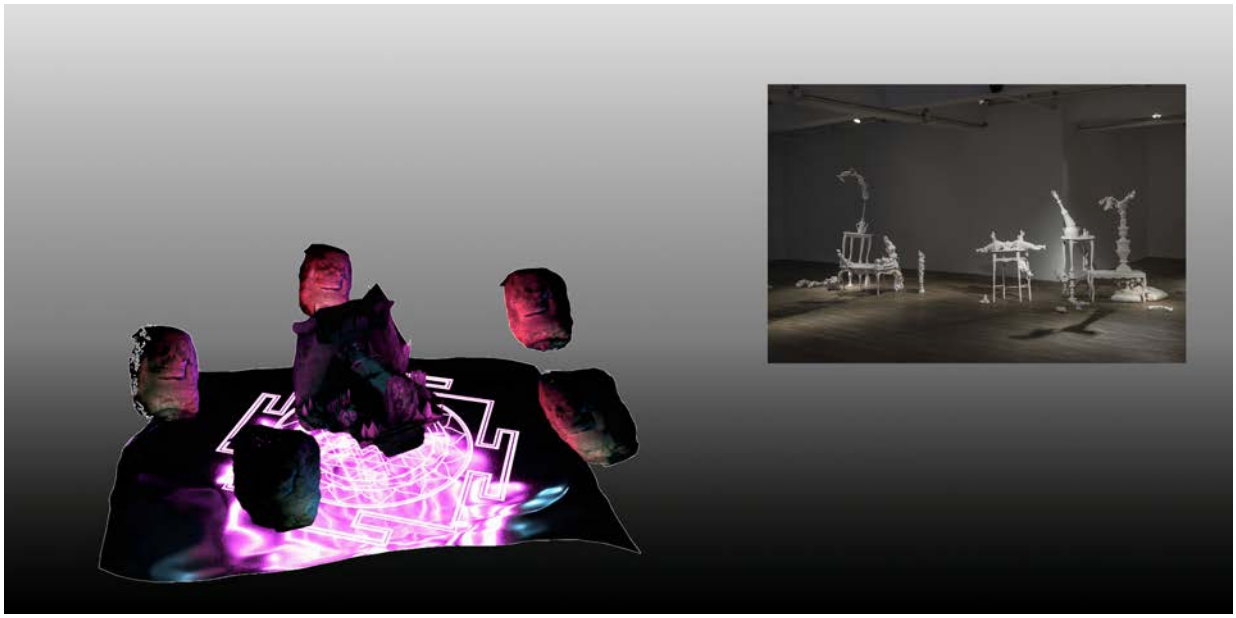
The evolving platforms and their underlying technologies enable varying approaches to spatial work. So far, this aspect has largely been overlooked in terminology. However, since these factors fundamentally shape both curatorial and artistic practice and the experience of the artwork, an attempt at a conceptual differentiation will be made here. Accordingly, a distinction can be made between two forms: the *digital* and the *virtual* online exhibition. While the former operates on the two-dimensional surface of the website, the latter allows for a three-dimensional experience. To illustrate the characteristics of these two forms in more detail, projects realized by the independent curatorial collective *peer to space* are presented below. Since 2016, the curatorial network has been realizing online exhibitions across various platforms, employing differ-

Exhibition view of *NARGIFUS—ANIMATED SELF PORTRAITS*, 2016–2019, curated by Carla Gannis and Tina Sauerlaender on NewHive (online), on view: Patrick Lichty and Shayna Hawkins. Photograph by Tina Sauerlaender © peer to space

ent approaches to presentation and interaction as well as integrating media such as VR. The projects offer the opportunity to present artworks to a global audience and to make them experienceable beyond the white cube of institutions or galleries. The ability to exhibit a significantly larger number of artistic positions enables a broader discourse and a more complex presentation of the respective topics.

For example, *NARGIFUS—ANIMATED SELF PORTRAITS* (2016–2019) explores animated self-portraits, while *CAT HEROICUS SUBLIMIS* (2016–2019) examines how artists develop an abstract visual language using digital tools.[11] These exhibitions were originally hosted on the platform NewHive, which is no longer available. The online

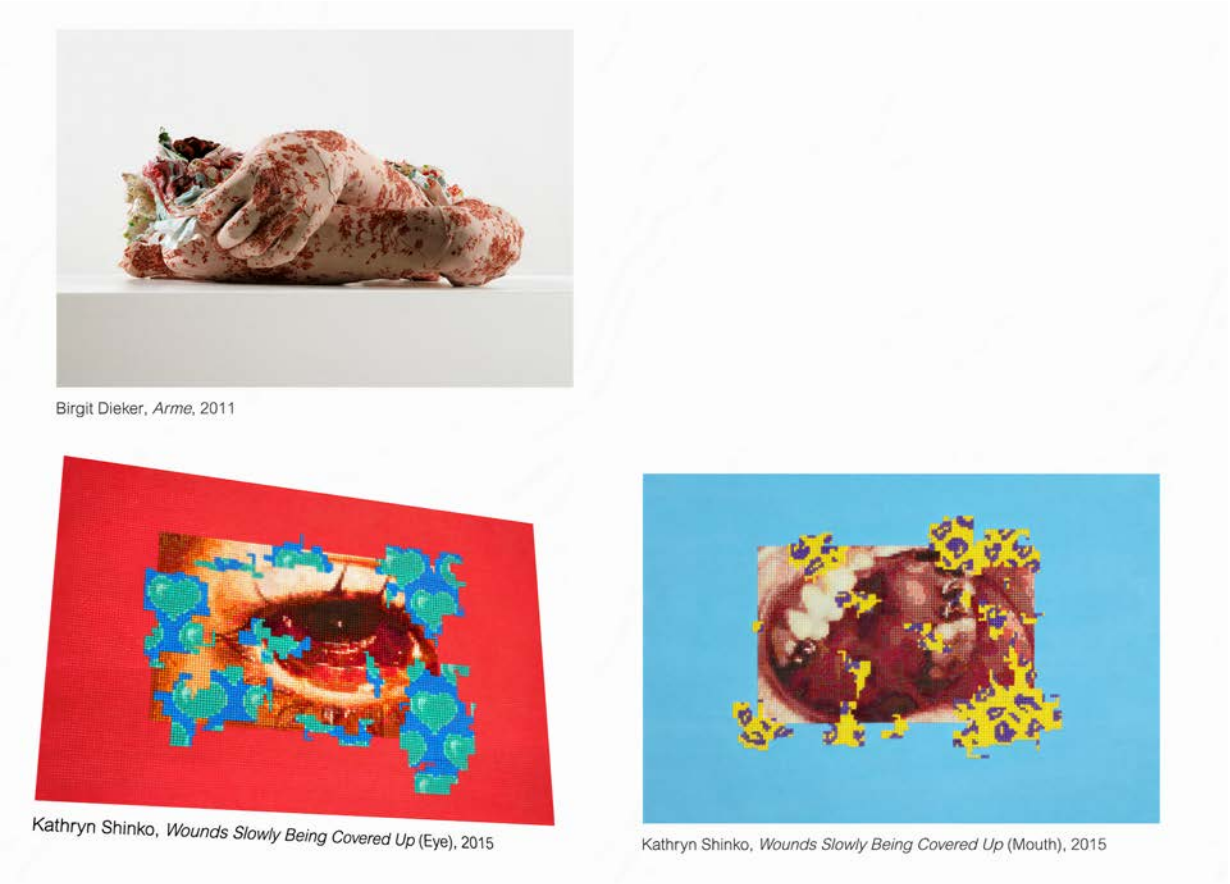
Exhibition view of *CAT HEROICUS SUBLIMIS*, 2016–2019, curated by Tina Sauerlaender and Peggy Schoenegge, on NewHive (online), on view: Od Niwr and Mathieu St-Pierre. Photograph by Tina Sauerlaender © peer to space



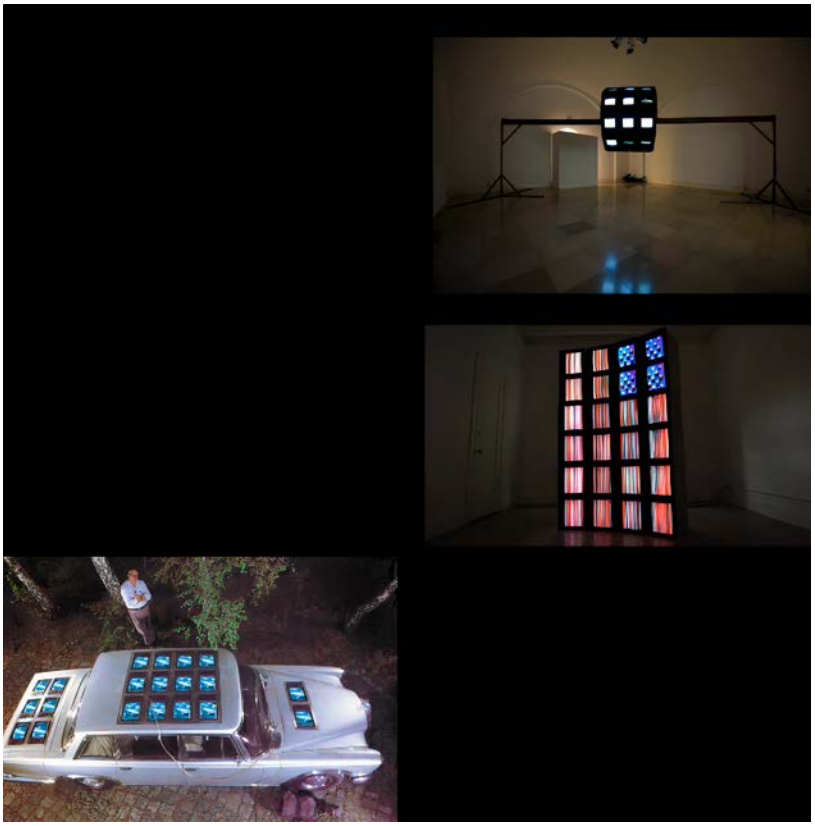
Exhibition view of *MERMAIDS & UNICORNS*, 2017, curated by Carlotta Meyer and Tina Sauerlaender (online), on view: Alfredo Salazar-Caro and Shyra De Souza. Photograph by Tina Sauerlaender © peer to space

exhibitions are now offline, once again highlighting the medium's reliance on providers and technical infrastructure. In response, the team has realized further shows on their own domains. *MERMAIDS & UNICORNS* (2017)[12], for instance, addresses the hybrid structures of contemporary times, arguing that the image on the screen, and thus the digital sphere, is real — contrary to the habit of describing this world as not being real. Here, rather than scrolling vertically, visitors navigate horizontally through the works. The group show *CLAIMING NEEDLES—Positions of Contemporary Embroidery Art* (2018)[13] examines contemporary embroidery art as a critical tool, expanding the meaning of female employment. As users move their mouse over the artworks, they become animated, and with a click, the audience can access additional information and detailed images. A similar approach is applied in *PARADOXICAL OBJECTS—Video Sculpture Art from 1960 to Today* (2021)[14], which reflects on the complexity of video sculpture, merging the temporality and dynamism of the moving image with the static nature of the screen. By applying various filters, visitors can alter the curatorial arrangement of the exhibited works, creating new connections. This produces new perspectives that extend beyond the curator's narrative.

These examples utilize the two-dimensional, partially infinite surface for a curated composition of works. New approaches were sought that go beyond the usual habitus, particularly with regard to the interactive possibilities for visitors. In the process, new forms of viewing and presentation were created.



Exhibition view of *CLAIMING NEEDLES – Positions of Contemporary Embroidery Art*, 2018, curated by Peggy Schoenegge and Darja Zub (online), on view: Birgit Dieker and Kathryn Shinko. Photograph by Peggy Schoenegge © peer to space



Exhibition view of *PARADOXICAL OBJECTS—Video Sculpture Art from 1960 to Today*, 2018,
curated by Sue Bachmeier and Peggy Schoenegge (online), on view: Frank Balve, Bainbridge Benton and Wolf Vostell.
Photograph by Peggy Schoenegge © peer to space

Another example of implementing the internet in curatorial practice is presented in the hybrid project *EVOLVING KINETICS—Transformations of Kinetic Art in the Post-Digital Age* (2023). This group exhibition at the Kunstmuseum Gelsenkirchen was also translated into an online format on the platform *Common Garden*, founded by the artist Constant Dullaart.[15] In the digital space, visitors also move across an infinite, two-dimensional tableau, where they appear as colorful Easter eggs — avatars representing their presence. When two or more users approach each other on the website, they can communicate with one another — much like in a video conference — and explore the exhibition together. This transforms the digital visit into a social experience, enabling a common online space.

EVOLVING KINETICS integrates digital structures into the art museum, not only creating a meaningful avenue to engage with emerging technologies but also laying the groundwork for the project's long-term sustainability and accessibility. By embedding digital elements within the museum's infrastructure, the project ensures that audiences can interact with artworks in innovative ways while also expanding the museum's reach beyond the physical audience. This approach supports the museum's adaptation to a digitally driven future, making art more accessible to diverse audiences and promoting continuous technological integration.

In this process, the examination of virtual space and thus virtual exhibitions is relevant—particularly in light of recent developments in WebXR technology. During the pandemic lockdown in 2021, *peer to space* collaborated with the gallery PRISKA PASQUER. As part of the *ONE TO ONE* series, peer to space's curators worked with one artist to

develop an exhibition concept for the virtual gallery, hosted on Mozilla Hubs. The platform was discontinued in May 2024. Until then, it offered low-threshold access to the three-dimensional virtual realm through a multimedia approach. Visitors were able to enter the spaces via smartphones, tablets, computers, or even VR headsets, and interact with each other in real time as avatars. The ONE TO ONE series tackled a range of contemporary topics, reflecting artistically on the post-digital conditions of our time. Furthermore, all iterations share the exploration of the virtual as a new space for experiencing art. While the exhibitions at PRISKA PASQUER did not fully abandon traditional spatial structures — since the physical location was digitally replicated — the series harnessed the potential of the virtual world in how the artworks were presented and perceived.

This was also applied in the case of PORTRAIT OF A FUTURE (2021–2024), which was part of the ONE TO ONE series. Here, artist Charlie Stein and I brought depictions of robots and AI applications to life, transforming them into animated sculptures embedded like driftwood or boulders along the gallery's virtual shore. In addition to these installation-like interventions, the dimensions of the artworks were adjusted as some of the paintings and drawings were either enlarged or reduced in scale, partly floating on the sea of the void. What is physically impossible due to material limitations and conditions can easily be altered with a single click in virtual space. This flexibility introduces a playful exploration of dimensions and settings. As a result, a new form of art experience emerges that pushes physical space into the background. In this context, the virtual becomes an object of experience, raising questions about our understanding of reality. Our physical reality becomes a memory in the virtual exhibition. Bound to our bodies, the immaterial environment makes us aware of our biological status, which is visually mirrored by avatars. In this framework, users experience a disembodied state of being, which in turn reflects back on the visitors themselves. This results in an exciting correlation between offline and online presence.

Exhibition view of *PORTRAIT OF A FUTURE*, 2021–2024, curated by Peggy Schoenegge at the Virtual Gallery PRISKA PASQUER on Mozilla Hubs (online), on view: Charlie Stein. Photograph by Peggy Schoenegge © peer to space

A similar situation prevailed in peer to space's inaugural Virtual Art Space exhibition *(IM)MATERIAL MATTER* (2021–2024), also realized on Mozilla Hubs. The group show explored the nature of digital sculptures, showcasing works by Banz & Bowinkel, Entangled Others (Sofia Crespo and Feileacan McCormick), Mohsen Hazrati, Armin Keplinger, Nadine Kolodziey, Lauren Moffatt, Chiara Passa, Sabrina Ratté, and Dagmar Schürrer. Beyond the physical realm, these digital works take on new forms of sculpture, illustrating the potential of digital materiality, which is also reflected in the space itself as both break away from traditional forms. There is no floor and there are no plinths or walls to present the works. Instead, floating platforms connected by a blue moving band illustrate the center of the void. Here, visitors have to fly or teleport themselves into the space in order to fully explore the exhibition, following a virtual approach to movement. The virtual sculptures float in space too. The three-dimensional artworks are not static, but dynamic and in constant motion. The works and the textures of the void appear as a seemingly tactile materiality. Their surfaces evoke physical materials like metal, plastic, and clay. Unlike in the physical sphere, these forms become permeable as visitors can walk through them. The dissolution of physical boundaries once again highlights the unique potential of the virtual. The artworks and the space oscillate between the material and the immaterial, revealing a virtual materiality. In deconstructing physical properties, the parameters of traditional definitions of sculpture and exhibition spaces shift, underlining digital conditions.

The transition to the web opens up a unique realm of art experience. Everything that can be imagined becomes possible, realizable, and thus experienceable. Exhibition visits transform into interactive digital experiences, free from physical constraints like gravity. Visitors navigate the space differently, exploring entirely new ways of engaging with the artwork — seeing them from the bottom to the top, from the outside to the inside. Particularly in combination with a VR headset, the computer-generated image

Exhibition view of *PORTRAIT OF A FUTURE*, 2021–2024, curated by Peggy Schoenegge at the Virtual Gallery PRISKA PASQUER on Mozilla Hubs (online), on view: Charlie Stein. Photograph by Peggy Schoenegge © peer to space

Exhibition view of *(IM)MATERIAL MATTER*, 2021–2024, curated by Peggy Schoenegge on Mozilla Hubs (online), on view: Banz & Bowinkel, Entangled Others (Sofia Crespo and Feileacan McCormick), Mohsen Hazrati, Armin Keplinger, Nadine Kolodziey, Lauren Moffatt, Chiara Passa, Sabrina Ratté, and Dagmar Schürrer. Photograph by Peggy Schoenegge © peer to space

shifts into an immersive three-dimensional space, where we perceive and explore the virtual space as an actual environment. Through this, a different and dynamic understanding of space itself develops, allowing us to rethink exhibitions.

Curating web-based spaces therefore goes beyond the mere discussion of the topics represented by the artworks. It shifts from a process that is object-orientated to one that is dynamically technology-orientated, understanding the internet as both an experiential space and a curatorial tool. Institutions and cultural practitioners require a thoughtful engagement, a deep understanding, and, above all, a useful application of the digital context. In the broadest sense, online curation can be seen as a site-specific installation that considers and integrates local and therefore technical conditions.

From this perspective, the web can also be understood as a form of *paraverse* — a parallel, yet deeply interconnected universe within the multiverse of the digital realm. It shapes and redefines perspectives on curation, challenging conventional notions of reality and space. In this context, it is subject to creative and artistic creation, allowing for entirely new, self-contained worlds. Within this space, reality is not merely replicated but actively redefined, creating speculative exhibition formats that go beyond traditional presentation methods. By integrating interactive elements, dynamic structures, and boundless spatial configurations, online exhibitions dissolve the limitations of the physical and open up entirely new dimensions of art experiences.

This digital turn calls for the exploration and establishment of technologically driven methods that create a modern form of access. Its application serves as a mirror of our time, dealing with a technologized reality that curators are also called upon to convey. They help foster a critical awareness of the digital landscape, encouraging audiences

to engage with contemporary art in a web-based realm. In this context, the medium itself becomes an object of contemplation, enabling a deeper understanding of the internet as a specific medium and 'zeitgeist' in general. This approach helps to break down barriers in engaging with new technologies. Strengthening media competence thus becomes essential for the inclusive formation of our digital future and thus for contemporary art exhibitions, promoting social participation. In this way, online exhibitions become more than digital displays; they transform paraversal spaces that reflect, challenge, and expand our understanding of art, technology, and reality in the present.

Notes

1 Katarína Rusnáková, "Internet Art and Its Formats," in *#mm net art. Internet Art in the Virtual and Physical Space of Its Presentation*, ed. Marie Meixnerová, Link Edition, Brescia + PAF, Olomouc, 2019: 15.
2 Rusnáková, "Internet Art and Its Formats": 20.
3 A detailed timeline can be found on Oliver Laric's website. http://oliverlaric.com/timeline.html
4 Ghidini Marialaura, "Curating on the Web: The Evolution of Platforms as Spaces for Producing and Disseminating Web-Based Art," *Arts* 8, no. 3 (2019): 2, https://doi.org/10.3390/arts8030078 (24.10.24).
5 In contrast to the static websites of earlier phases of the internet, web 2.0 refers to the era of the internet characterized by user-generated content, interactivity, and social platforms, which started in the early 2000. Web 3.0 is often associated with blockchain technology, decentralization, and semantic web concepts, envisions a more autonomous and user-controlled digital environment. This era began around the 2015s. The metaverse, on the other hand, describes immersive, shared virtual worlds where users interact with each other and digital content in real time, often leveraging virtual reality (VR) and augmented reality (AR) technologies. There are initial approaches to the latter, but it has not yet been fully implemented.
6 WebXR is a technology that allow users to experience AR and VR content directly within web browsers without the need for external applications. It facilitates immersive and interactive experiences by integrating 3D environments, objects, and spatial interactions into standard web interfaces, enabling new possibilities for digital art and online exhibitions.
7 Francesca Baglietto, "Curating across interfaces: an Account of a(Hybrid) Expanding Exhibition", PhD thesis, University of the Arts London, London, 2016.
8 David England, Thecla Schiphorst, Nick Bryan-Kinns (Ed.) „Curating the Digital. Space for Art and Interaction", Springer. Switzerland, 2016.
9 Annet Dekker, «Curating Digital Art», Valiz Amsterdam, Amsterdam, 2021.
10 Lívia Nolasco-Rózsás with Marianne Schädler (Ed.), "Beyond Matter, within Space. Curatorial and Art Mediation Techniques on the Verge of Virtual Reality", Hantje Cantz, Karlsruhe, 2023.
11 Find more details under: http://www.peertospace.eu/onlineexhibitions.
12 http://www.mermaidsandunicorns.net
13 http://www.claiming-needles.net
14 http://paradoxical-objects.net
15 http://evolvingkinetics.common.garden

Peggy Schoenegge is an independent curator, writer and project manager at peer to space, as well as the head of the board of the Media Art Association in Berlin. Her work focuses on the conditions and challenges of the post-digital age and its impact on our everyday life, culture and society. Specifically, she addresses topics such as gender, performance, and artificial intelligence in the context of current technological developments. By curating digital art, internet art and art created with new media such as VR or AR, she realizes international group exhibitions in both physical and virtual spaces. In this framework, she explores strategies for contemporary and media-based forms of presentation. In addition, she lectures and participates in panel discussions at international conferences, symposia and events. She teaches at the University of Applied Sciences Darmstadt and HTW—University of Applied Sciences Berlin. Currently, Peggy Schoenegge is pursuing a PhD on the theoretical and practical implications of web-based art spaces and their development from the initial stages of the internet until today at the Institute of Art History at the University of Bonn.

Virtual Worlds and Digital Ecology in the Exhibitionary Internet Complex: Jakob Kudsk Steensen's *Berl-Berl* and *Boreal Dreams*

Hauke Ohls

There are probably few people who despise the internet as much as Jonathan Crary. The American art historian and Professor of Modern Art and Theory at Columbia University in New York openly acknowledges that his book stands in the "tradition of social pamphleteering."[1] Rather than offering a balanced analysis, he aims to express the "truth of shared understandings and experiences."[2] Crary launches a broad attack on digital technologies such as "AI, robotics, neuroscience, augmented/virtual reality, autonomous vehicles, nanotechnology, genomics, and the Internet of Things (IoT)."[3] What ties all these technologies together, he argues, is their dependence on or enablement by the internet — a condition he summarizes with the term "the internet complex." Over the course of the book, he outlines a growing list of consequences: the erosion of intersubjective exchange and community, the massive ecological footprint of digital technologies, the spread of surveillance, the suppression of decolonial movements, the loss of childhood experiences, and the overarching control of life through a digital protocol aimed at maximizing capital returns — serving the expansion of quasi-oligarchic power structures.[4]

Jakob Kudsk Steensen, *Berl-Berl*, 2021: Live simulation (still). Commissioned by LAS Art Foundation. Courtesy the artist.

To clarify his position, Crary turns to an analogy: "The internet is the digital counterpart of the vast, rapidly expanding garbage patch in the Pacific Ocean."[5] For him, it is an accumulation of data waste that renders thinking, dialogue, and agency impossible. His assessment of creativity is no more optimistic — what we find on the internet, he claims, are at best "poems, but not poetry."[6] At times, he distinguishes between individual technologies and emphasizes their harmful potentials. Yet he avoids the more nuanced argument that how these tools are used — depending on context and intention — can also yield constructive, even empowering, outcomes.

How can one respond to such polemical claims when analyzing artworks that are grounded in the internet or fundamentally engage with its logic — as is the case in this special issue on the paraverse? To reframe the question, if the exhibition of virtual worlds takes place within the internet complex, what does this mean in the context of the paraverse — especially when artworks are themselves conceived as digital environments of display? Crary certainly raises valid concerns. While it may be overly reductive to attribute the current polycrisis solely to the monetization of the internet by a powerful few, the concentration of control over what were once digital commons and the financialization of data do generate disruptive dynamics.[7] In contrast, a wide range of artist-activist projects fight for freedoms within the digital sphere — even if their victories are small or largely symbolic.[8] The internet is also a space where struggles for a better internet unfold.

The works by Jakob Kudsk Steensen analyzed in this text represent an alternative approach. Created through digital technologies embedded in the internet complex, they include the internet as one of their exhibition sites. *Berl-Berl* (2021) and *Boreal Dreams* (2025) would not exist without these very technologies and infrastructures. Both works engage with ecological questions, and Kudsk Steensen, together with his team and through field research, creates digitally immersive virtual worlds to explore them. These works offer viewers insights that would not be achievable without digital,

Jakob Kudsk Steensen, *Boreal Dreams*, 2024-25: Live simulation (still). Commissioned by the Fondation Beyeler, Riehen/Basel. Courtesy the artist.

internet-based technologies. They are speculative journeys through a resurrected past composed of present-day material, embedded in a mythical audio-visual assemblage, as in *Berl-Berl*. Or they are speculative visions of the future, whose narratives are grounded in current research, as in *Boreal Dreams*.

Both artworks open up new perspectives on ecological processes by intertwining them with digital technologies embedded in the internet complex. Kudsk Steensen's artistic practice invites us to perceive far-reaching ecological relationalities across non-linear temporalities, while simultaneously opening connections to the digital realm — without reinforcing the assumed dichotomy between ecological environments and technology.

The virtual worlds of *Berl-Berl* and *Boreal Dreams*

In both *Berl-Berl* and *Boreal Dreams*, Kudsk Steensen builds his virtual environments using the Unreal Engine platform, a tool originally designed for video game development. He fuses an aesthetic of gamification with ecological narratives, turning them into immersive explorations of digital environments.[9] In both works, he applies microphotogrammetry and transforms the captured data into intricate 3D models using specialized software. These hyperrealistic digital landscapes are then enriched with an expanding array of visual and sonic elements. Real-time rendering techniques capture atmospheric conditions and generate a continuously evolving live simulation. Rather than relying on industry-standard templates, as is common in game development, Kudsk Steensen creates entirely original, virtual worlds — ones that prioritize sensory experience and ecological storytelling over playability or a final objective.[10]

The artworks take the form of three-dimensional spaces without predefined tasks — environments that viewers are invited to explore interactively. This is especially true in one of their modes of existence that is inherent to the works themselves: both can be accessed online as desktop experiences.[11] Another mode emerges in the context of exhibitions, where the works are presented as multi-screen installations integrated into physical spatial settings — that is, into analogue space. Depending on the reception context, the works function in fundamentally different ways. At home, seated in front of a personal computer with headphones on to enhance the sonic dimension, interaction takes on a more prominent role. Viewers can control the pace and sequence of their experience, which in turn facilitates a more individualized processing of information. In exhibition spaces — whether in a former industrial hall or a museum's sculpture garden — the works produce an overwhelming aesthetic that unfolds within a spatially immersive environment. The multi-screen scenography engages the viewers' bodily movement more directly, requiring physical navigation through the space. Each presentation format offers distinct modes of immersion into these virtual worlds, a point that will be explored further below. Given that this special issue focuses on the paraverse, the online versions of the works take precedence in my discussion.

Nonetheless, there are key differences between the two works: *Berl-Berl* concentrates on swamps, with a particular focus on the wetlands surrounding Berlin, Kudsk Steensen's former place of residence. In *Boreal Dreams*, the focus shifts to the forests of the boreal climate zone and their climate resilience.

On the artist's website, *Berl-Berl* is officially dated as "2021–ongoing" and described as a "live simulation and virtual performance stage."[12] While 2021 marks the work's initial completion, the designation "ongoing" is justified, as the simulation continuously regenerates in new and unpredictable ways through AI algorithms. The title reflects the artwork's thematic focus: "Berl" is an old West Slavic and Sorbian term meaning

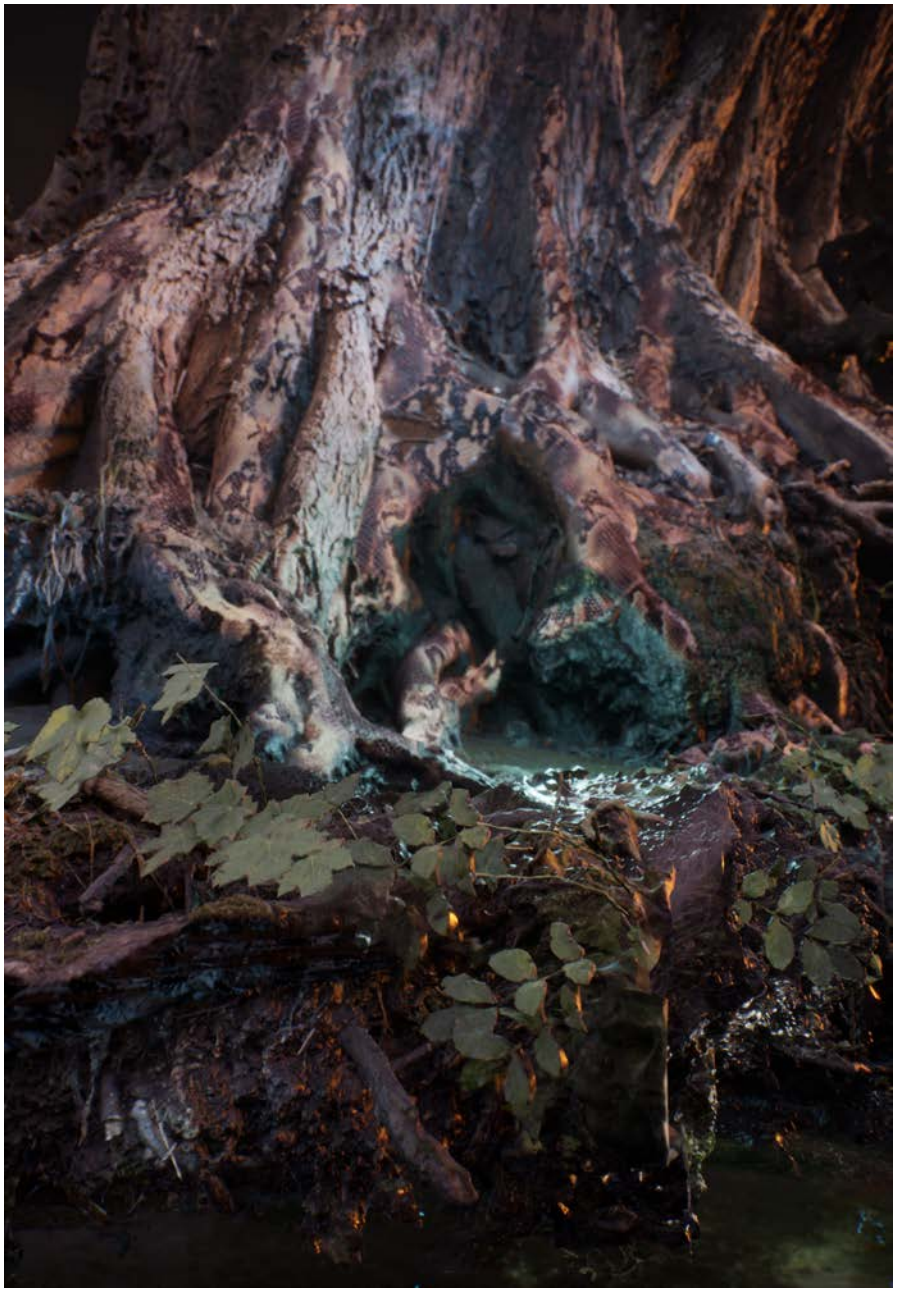
"swamp," and is likely the linguistic root of the city name Berlin.[13] *Berl-Berl* was commissioned by the Berlin-based LAS Art Foundation, an organization that funds exhibitions, projects, performances, artistic research, and educational initiatives at the interdisciplinary intersection of art, technology, and science. The work was first installed in the summer of 2021 in the Halle am Berghain in Berlin; it unfolded across a series of large-format screens arranged on multiple levels, accompanied by a site-specific sound installation and, in part, a black, reflective floor surface.[14]

The accompanying publication of *Berl-Berl* provides extensive documentation, offering detailed insights into the artwork's development and production process. For instance, Kudsk Steensen collaborated with the Museum für Naturkunde (Museum of Natural History) in Berlin and gained access to its collection of over 30 million specimens.[15] In a conversation with the museum's director, Johannes Vogel, which opens the publication, the artist explains that he and his team worked with the museum's animal sound archive to integrate frog calls into the live simulation using AI-driven algorithms: "We're working with a local frog from Berlin, and the system can mix frog sounds over time periods in this region, modifying, slowing and connecting them to reflect an environment."[16] In addition, the museum provided other natural specimens, which were 3D-scanned and incorporated into the newly created virtual world.[17]

Most of the material, however, was gathered by Kudsk Steensen and his team during field research in the swamps surrounding Berlin. Back in the studio, countless macro-detail photographs and field recordings are transformed into a digital speculation grounded in real-world references. Into this speculative world, the artist also weaves elements of Slavic mythology — most notably in the form of a Triglav.[18] In *Berl-Berl*, the deity appears as a three-headed tree, symbolizing the spheres of "heaven," "earth," and the "underworld."[19]

Jakob Kudsk Steensen, *Berl-Berl*, 2021: Live simulation. Commissioned by LAS Art Foundation. Installation view: Halle am Berghain, 2021. Photograph by: Timo Ohler. Courtesy the artist.

One of the defining features of the online simulation of *Berl-Berl* is the viewer's ability to actively navigate between different layers of the environment. We can dive into the swamp, zoom in on the root system of a tree, linger at the water's edge, or gaze up into the sky. The aesthetic of *Berl-Berl* shifts depending on the point of view: at times, it reveals intricate detail; at others, it dissolves into colourful clouds of graphic points, giving the impression of entering the swamp's molecular level. This visual dynamic in *Berl-Berl* (and *Boreal Dreams*) emerges from the deliberate inclusion of various stages in the technical transformation from photographic images to digital 3D objects in photogrammetry. After the photographs have been taken, the process begins with aligning the images using structure-from-motion algorithms, which identify shared visual features and calculate the relative camera positions. This generates a sparse point cloud, which is then densified to create a more detailed three-dimensional representation. From this dense point cloud, a polygon mesh is constructed to define the



Jakob Kudsk Steensen, *Berl-Berl*, 2021: Live simulation (still). Commissioned by LAS Art Foundation. Courtesy the artist.

object's surface. Finally, photographic textures are projected onto the mesh. By incorporating these successive stages into the final works, the artist creates a dynamic interplay that reveals past and present swamp entities — preserved and continually regenerated within the digital sphere.

The complex auditory dimension of the artwork is just as essential to its virtual world as the real-time imagery. The soundscape is composed of archival recordings from the Museum für Naturkunde, field recordings from the swamps, and vocal contributions by singer Acra.[20] Sound artist Matt McCorkle wove these elements into a composition that continuously shifts through programmed algorithms.[21] The result is not a fixed soundtrack but a dynamic interplay of individual sounds that, depending on the viewer's perspective and movement within *Berl-Berl*, generate an evolving sonic texture— one that feels like a distorted, sustained synthesis of natural environments and technological artifacts. It evokes a kind of speculative bioacoustics, aiming to make audible the sonic phenomena of a swamp, including frequencies that would otherwise escape the range of human hearing.

With *Berl-Berl*, Kudsk Steensen creates a virtual swamp that — through the interplay of its various dimensions and its continuous live simulation — is not a documentation of the few remaining wetlands around Berlin. Rather, it is a crossing of places, times, myths, and nonhuman as well as more-than-human beings, shaped through artistic practice. Rooted in field research, this practice aims to translate ecological observation into the internet complex through the use of cutting-edge technologies.

A similar approach can be observed in Kudsk Steensen's *Boreal Dreams*. The parallels with *Berl-Berl* — in terms of photogrammetry, gamification, real-time rendering, and the resulting aesthetic — have already been noted, as has the hybrid existence of the work between immersive installation and internet-based screen presentation. Dated 2025, *Boreal Dreams* is described by the artist as a "Live Simulation, Spatialised Sound, and Online Interactive Experience."[22] The work was commissioned by the Fondation Beyeler as a contemporary counterpart to its *Northern Lights* exhibition (26 January–25 May 2025), which focuses on Scandinavian landscape painting from the classical modern period. Kudsk Steensen developed his work in response to the exhibition's theme, specifically for the sculpture garden of the Renzo Piano-designed museum building in Riehen near Basel. The artwork is presented outdoors on two large-scale double-sided screens, each with a front and back projection surface. In addition, an online version allows for interactive engagement, where the focus shifts more strongly toward user participation.

The title refers on the one hand to the boreal forest, and on the other to the work's narrative strategy: bringing together the transformations driven by the climate crisis with the motif of the dream. In a video produced for the website of the Fondation Beyeler, the artist outlines the project's theme, his intentions, the collaborating partners, and the physical location from which the digitized material originates.[23] Additionally, the *Boreal Dreams* website includes an information section that provides background on the artwork.

The starting point of the work is the Marcell Experimental Forest (MEF), a research site located in northern Minnesota. Situated within the Chippewa National Forest, the MEF allows scientists to conduct climate research under real-world ecological conditions in line with Earth system science.[24] Glass octagons are embedded within the coniferous forest and connected by narrow walkways, resembling greenhouses or arti-

ficial climate capsules taken from a science fiction film. Researchers at the MEF use these structures to simulate various degrees of temperature rise caused by anthropogenic climate change and to study their effects on the boreal forest ecosystem.

Kudsk Steensen appropriated the architecture of the research site and translated both its structures and testing conditions into a virtual world. Together with his team, he conducted fieldwork within these artificially constructed environments, which anticipate future scenarios based on current climate developments. Inside the octagons, plant life and species were digitally recorded, and sound material was collected. For the latter, he once again collaborated with sound artist Matt McCorkle.

When exploring the web-based version of the artwork, we are first greeted by a brief intro, followed by a map of *Boreal Dreams*. The map features five stations, each marked with a simulated temperature increase and a title that reads like a subtitle of the artwork: +0° *The Boreal Forest*, +2.5° *The Marcell Experiment*, +4.5° *Chronobiology*, +6.5° *Circadian Architecture*, and +9° *Dream*. Upon selecting a station, we are prompted to either begin exploring it or to first learn more about it. If we choose to explore, subtitles begin to appear on screen as we enter the environment. These texts, written by dream researcher Adam Haar Horowitz, read as a hybrid of factual insights into the climate resilience of the boreal forest, speculative nature writing, and cutting-edge findings from dream research — a blend of information and poetry.

Inside the octagons, viewers can move freely, though each station transforms into a spherical environment suspended in a black, boundless space. Even more than in *Berl-Berl*, the virtual world of *Boreal Dreams* is composed of coloured points that coalesce into ghostly surfaces of objects and plants. Certain elements within each station light up;

Jakob Kudsk Steensen, *Boreal Dreams*, 2024-25: Live simulation. In collaboration with Northern Research Station of the USDA Forest Service. Commissioned by the Fondation Beyeler, Riehen/Basel. Installation view: Fondation Beyeler 2025. Photograph by: Mark Niedermann. Courtesy the artist.

when clicked, they trigger an automated movement around the object accompanied by subtitles that unfold a fragmented, associative narrative — at times, the boreal forest itself seems to speak directly to us through these lines. With the exception of the final station, *Dream*, each station offers three clickable elements. These, however, must be activated in a predetermined order, which limits the freedom of choice. The stations themselves can be accessed in any sequence, and we can return to the map at any time. Navigation within the stations is generally smooth, though at one point — in +2.5° *The Marcell Experiment* — I found myself deep in the thawing permafrost, unable to resurface.

The higher the temperature levels indicated in each station, the more irreversible the ecological damage becomes. At +4.5° *Chronobiology*, the tipping points for the boreal forest have already been crossed. In the final station, +9° *Dream*, the forest has disappeared entirely. Instead, we enter a speculative architecture composed of points and fields of light. At its centre is a single clickable element — a plant or blossom that also appeared in earlier stations, now rendered as a spectral presence in an uninhabitable environment. In +9° *Dream*, the composed soundscape moves to the forefront. As the introductory text suggests, the ideal experience is to let it play during sleep, inviting us to dream of the boreal forest. At this point, dreaming of what has been lost becomes the only way to draw it into the present. The live simulation's soundscape begins with sustained ambient tones, which gradually give way to natural sounds.

An especially compelling station is +6.5° *Circadian Architecture*, which introduces a self-reflexive, technology-critical narrative: the scenario depicts an artificial world saturated with technical applications, in which we can only watch the forest die. According to the narrative, this happens through our screens, whose blue light continues to stimulate melatonin production: our eyes remain wide open while the world fades away. This invites a connection to Crary's critique, in which the technological products he associates with the internet complex trap us in a maelstrom of surveillance and interaction. The effect echoes the argument he developed in his earlier book *24/7*, where he analyzes the suppression of sleep as the final frontier capitalism seeks to colonize — transforming even rest into a profit-generating resource.[25]

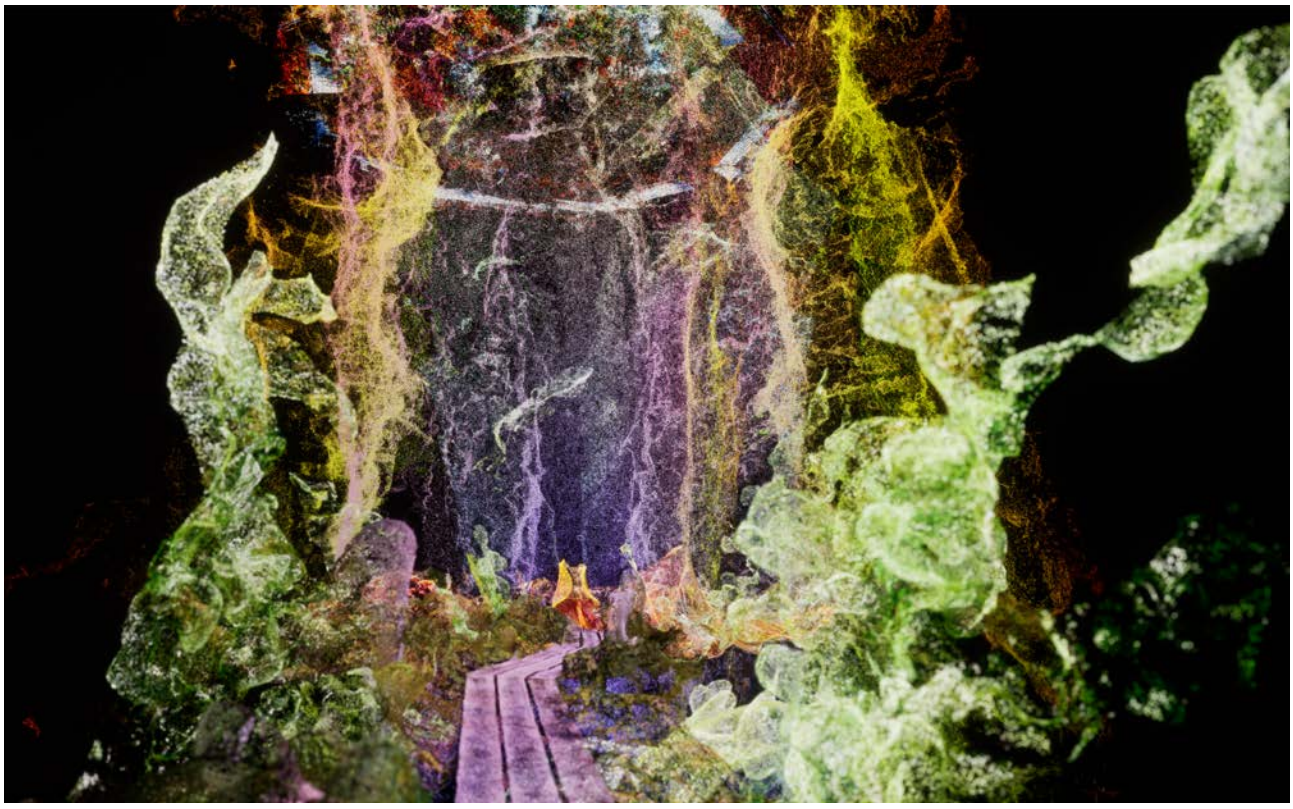
That this critique of technology — when linked to ecological concerns — must itself be critically examined within the context of a virtual world seems self-evident, given that such worlds rely on digital technologies, server infrastructure, energy consumption, and resource extraction.[26] Extended reality technologies enable new forms of artistic expression and expand global access to cultural experiences, yet they also entail considerable ecological challenges.[27] In this regard, both *Berl-Berl* and *Boreal Dreams* occupy an ambivalent position: without the technical infrastructures that contribute to climate change, these works would not exist; at the same time, both virtual worlds seek to foster ecological awareness and, by extension, reduce environmentally harmful behaviour. The paradox of artworks that aim to raise ecological consciousness while simultaneously generating ecological collateral damage has been a subject of debate at least since the critique of Olafur Eliasson's *Ice Watch* in 2014.[28]

One might argue that Kudsk Steensen does not extract physical materials to transform them into artworks, as is often the case with non-digital practices. Nevertheless, server and computing power, hardware, logistics, and travel remain essential to the creation of these virtual environments in the paraverse. If one shifts the focus to these variables, the question of delineation quickly arises — after all, every human action is entangled with extraction.[29] Even the research, reception of the artworks, and writing of this text

depend on the internet complex, to borrow Crary's terminology. A more troubling issue arises when the ecological footprint of an artist working on environmental themes is equated with systemic power structures, such as the global lobbying apparatuses of fossil industries under neoliberalism.[30]

This ambivalence resonates with a recurring topos in the literature on Kudsk Steensen: his artworks challenge ecological issues precisely by generating new experiential worlds. As noted in relation to his 2019 work *The Deep Listener*, his practice fosters "new sensibilities that are more tangible," leading to "alternative ways of thinking and caring for the more-than-human world."[31] Similarly, *Re-Animated* (2019) has been described as a work that "shifts users' perspectives and generates a wider range of affective responses to species loss and revival."[32] This shift in perspective is also reflected in the viewer's position: "In his works it is indeed the environment that takes over by making the viewer become part of it."[33]

Whether virtual artworks that engage with ecological questions actually influence the environmental awareness of their viewers can be examined through the lens of research on digital nature experiences. Studies on this topic speak with notable clarity: digital technologies not only shape how we interact with the environment, but also contribute to a fundamental redefinition of what "nature" means.[34] Moreover, virtual nature experiences have been shown to support ecological education and even enhance psychological well-being.[35] To connect these findings with artistic practices, the term "eco-digital" has been introduced — referring to a heightened awareness of environmental issues, often facilitated through interactive engagement.[36] How these insights apply to *Berl-Berl* and *Boreal Dreams* is one of several aspects explored in the final section.



Jakob Kudsk Steensen, *Boreal Dreams*, 2024-25: Live simulation (still). Commissioned by the Fondation Beyeler, Riehen/Basel. Courtesy the artist.

Digital ecology in the internet complex

As one might expect from Crary's sweeping critique of the internet, his book offers no hopeful conclusion. Community and solidarity, he argues, cannot emerge within the internet complex, as it is rooted in neoliberal strategies of market-based individualism. Instead, he opts for sketch-like proposals and a final appeal.[37] What he sees as essential is the reinvention of sociality — above all through the recovery of lost or marginalized forms of knowledge — yet this knowledge, he insists, cannot be found online.[38] Screens, he writes, lead only to absorption "to an immaterial architecture of separation," resulting in the "dissipation of curiosity about otherness or about the wondrous plenitude of non-human life."[39] In light of Kudsk Steensen's works, one must ask: what forms of "curiosity" do these two virtual worlds — operating from within the internet complex — manage to evoke?

As outlined in the introduction, it is precisely the connection between the internet complex and ecological concerns that opens up the possibility of moving beyond the limitations Crary describes. Both *Berl-Berl* and *Boreal Dreams* offer insights into ecological processes — insights that are made possible only through digital technologies. The aesthetics of these works play a decisive role: the hyperreal swamp and coniferous forest environments invite exploration and create the impression that we are able to perceive more than the human sensory spectrum — on a molecular level, for instance, or beyond the visible colour scale. To achieve this effect, Kudsk Steensen integrates the various stages of photogrammetric processing, as previously described, into the aesthetic structure of his works. Equally significant is the use of sound, which introduces frequencies that lie outside the bounds of human hearing.

What matters is not just the interactivity of these virtual environments, but the fact that vision and sound are embedded within a live simulation — one that we actively move through. These immersive worlds address the stream of consciousness, a central component of human experience. The live simulation carries a latent promise: the potential to perceive something continuously anew, without beginning or end — even if it is ultimately driven by the complex computational processing of predetermined variables.

Of course, not all dimensions of life can be replicated — especially when it comes to notions of community, which Crary sees as essential. The kind of communal experience possible in a factory hall or museum garden cannot simply be transferred to the solitary situation in front of a desktop screen. But to expect this would be misleading, as these virtual worlds are not intended to be perfect replicas of analogue life. What is more productive is to acknowledge the limitations of these digital environments while fully exploring their potential — namely, their ability to show us things we could not perceive in a physical swamp or boreal forest.

This includes the complex entanglement of pasts, presents, and futures that both works explore. In the live simulation perceived as present, *Berl-Berl* layers the historical wetlands of Berlin — not as an act of revival, but as a performative speculation — with a speculative future scenario: the simulation of a dried-out wetland, desiccated by the climate crisis. To understand this, several features of the work must be considered: the digitally recreated and modified animal calls, the mythological references, the precise documentation based on photogrammetry of real swamps in the Berlin region, and their histories — marked by a long trajectory of drainage since the onset of industrialization. Added to this is the projection of their potential disappearance as a result of accelerating climate change.

In *Boreal Dreams*, this entanglement of temporalities is structured in a similar way and appears more explicit. The focus lies primarily on the relationship between present and future. The historical responsibility of the Global North — particularly its massive contribution to greenhouse gas emissions — must also be acknowledged, as it forms the very premise for the MEF simulations. In terms of the artwork, it is the present of the live simulation through which we move, interwoven with a range of speculative futures, each shaped by a different degree of global warming. As previously noted, the work is not a documentary representation of the situation in Minnesota, but a distinct artistic speculation. The audio-visual phenomena encountered within the octagons can only unfold within the virtual world. Without the digital technologies of the internet complex, this experience would remain inaccessible.

As Manuel DeLanda already demonstrated in *A Thousand Years of Nonlinear History* (1997), history unfolds through a series of nonlinear processes.[40] Emergent feedback loops are the rule rather than the exception. While DeLanda focused on geological, biological, and semiotic dynamics, the digital can now be understood as an additional force driving nonlinearity. Past, present, and future are intricately entangled: layers of the past intersect with the fluctuating conditions of the present and are simultaneously linked to emergent futures.[41] The temporal structures within *Berl-Berl* and *Boreal Dreams* are highly compatible with DeLanda's theory. As viewers, we find ourselves suddenly immersed in this vortex — deprived of stable constants such as cause and effect that typically anchor our perception.

Just as central as the temporal dimension in *Berl-Berl* and *Boreal Dreams* are the immersive qualities of these works. Here, it is important to preempt potential misunderstandings: artworks that generate virtual worlds should not automatically be equated with immersive art experiences.[42] However, one can argue that works based on virtual techniques actively foster interaction and reflection on the part of viewers, precisely because they invite an exploration of the boundary between virtual and physical everyday life — an engagement that opens up epistemic dimensions.[43]

Felix Stadler has addressed the interrelation of immersion and aesthetics in the context of two defining forces of our time: digitalization and the climate crisis. He, too, begins by emphasizing that immersion is a normal part of everyday experience.[44] In contrast, the aesthetic contemplation of artworks — the traditional opposition between subject and object—is an artificial construct. Digitalization and climate change collapse this distance entirely: "There is no outside, but only specific positions within a complex, dynamic system, and multiple relationships of exchange and interdependency characterize these positions."[45] As a result, "the classic task of aesthetics" is redefined: to make perceptible that we are immersed in a world where agencies unfold on nonhuman scales —"too small, too large, too quick, or too slow to perceive without technological aids."[46]

Immersion in the virtual worlds of *Berl-Berl* and *Boreal Dreams* brings digitality and the climate crisis into a shared experiential space. Both works participate in what Dane Sutherland has described as the "eco-logic of the swamp."[47] Understood as a metaphor, the swamp's processual and relational logic continually dissolves binaries such as organic and synthetic, real and virtual, past and present.[48]

The works by Kudsk Steensen analyzed here demonstrate that digital media hold potentials that go beyond the mere documentation of environments. These artworks function as technopolitically embedded agents that, through their modes of mediation, open

up new possibilities for perception, relation, and articulation between human and more-than-human worlds. In the sense of the concept of "digital ecologies," these virtual worlds do not operate as neutral interfaces, but as "situated, political, and affective mediators" that exert ambivalent effects on existing ecological and societal conditions.[49]

Berl-Berl and *Boreal Dreams* do more than create new spaces of virtual experience — they negotiate the conditions of a digital ecology within the "technonatural present," a state in which digital infrastructures and more-than-human life-worlds are inextricably intertwined.[50] The potential of these artworks does not lie in a technodeterministic hope for "green digital solutions," but rather in their capacity to produce "glitches" — productive disruptions within the digital mediation process.[51] Precisely in moments when the immersive simulations unsettle, provoke disorientation, or introduce breaks and a loss of control, epistemic cracks emerge — cracks through which an expanded perception of the ecological crisis can begin to surface.

Rather than affirming Crary's view of the digital as a wholly destructive system, Kudsk Steensen's works open up alternative perspectives from within the internet complex itself. While Crary presents the digital as a closed and corrosive force that undermines creativity, community, and ecology, *Berl-Berl* and *Boreal Dreams* reveal that it is precisely within this sphere that new forms of relational thinking, aesthetic experience, and ecological reflection can emerge. In this context, both virtual worlds function as more-than-human (web)sites within the eco-digital: they generate complex entanglements of real and virtual entities, bringing together multiple temporalities and modes of existence in digital space. Within the framework of the paraverse and the migration of artworks into the digital sphere, these works assert their presence as self-contained virtual environments that must navigate the conditions of the internet complex. In contrast to the disruptive dynamics Crary outlines, these virtual exhibition spaces propose an alternative world. The internet complex is not merely a wasteland, but also a contested site — and co-creator — of ecological counter-narratives and future imaginaries.

Notes

1 Jonathan Crary, *Scorched Earth: Beyond the Digital Age to a Post-Capitalist World* (London: Verso, 2022), 3.
2 Crary, *Scorched Earth*, 3.
3 Crary, *Scorched Earth*, 59.
4 In his 2022 book, Crary repeatedly addresses the accumulation of power by billionaires who control parts of internet-based services, which seems particularly topical given the current political climate, especially in the United States.
5 Crary, *Scorched Earth*, 42.
6 Crary, *Scorched Earth*, 86.
7 Philipp Staab, *Markets and Power in Digital Capitalism* (Manchester: Manchester University Press, 2024).
8 Gabriella Coleman, *Coding Freedom: The Ethics and Aesthetics of Hacking* (Princeton, NJ: Princeton University Press, 2013)
9 Alenda Y. Chang, *Playing Nature: The Virtual Ecology of Game Environments* (Minneapolis: University of Minnesota Press, 2019).
10 Alenda Y. Chang, "In Technology, Nature?," in *Jakob Kudsk Steensen: Berl-Berl*, ed. Emma Enderby (Berlin: Light Art Space; Cologne: Koenig Books, 2021), 126.
11 The artwork *Boreal Dreams* can be accessed via this link: https://borealdreams.live (accessed May 12, 2025). The *Berl-Berl* website https://www.berlberl.world is currently

inaccessible (last access May 12, 2025). During my research for this text, I visited the virtual world hosted on the site several times; it is maintained by the commissioning institution, the LAS Art Foundation. This creates an intriguing situation: at present, the artwork exists only hypothetically in the digital space, since the simulation fails to load. This temporary disappearance points to a broader condition of digital art within the paraverse: its dependence on fragile infrastructures, institutional hosting, and maintenance cycles.

12 Jakob Kudsk Steensen, *Berl-Berl*, https://www.jakobsteensen.com/berlberl (last access May 12, 2025).

13 Barbara London, "Navigating the Ineffable," in *Jakob Kudsk Steensen: Berl-Berl*, ed. Emma Enderby (Berlin: Light Art Space; Cologne: Koenig Books, 2021), 156.

14 Emma Enderby, "Real Fantasy," in *Jakob Kudsk Steensen: Berl-Berl*, ed. Emma Enderby (Berlin: Light Art Space; Cologne: Koenig Books, 2021), 68.

15 Kim Mortega, "Retracing Berlin's Wetlands," in *Jakob Kudsk Steensen: Berl-Berl*, ed. Emma Enderby (Berlin: Light Art Space; Cologne: Koenig Books, 2021), 160.

16 Jakob Kudsk Steensen and Johannes Vogel, "Cataloguing the Natural World," in *Jakob Kudsk Steensen: Berl-Berl*, ed. Emma Enderby (Berlin: Light Art Space; Cologne: Koenig Books, 2021), 39.

17 Enderby, "Real Fantasy," 69.

18 Triglav is a deity from Slavic mythology, particularly venerated in West Slavic regions, whose name means "three-headed." The figure is associated with ancient pagan cosmologies and was worshipped as a powerful guardian of equilibrium between divine, terrestrial, and chthonic forces.

19 London, "Navigating the Ineffable," 159.

20 Cristina Baldacci, "Re-Enacting Ecosystems: Jakob Kudsk Steensen's Environmental Storytelling in Virtual and Augmented Reality," *Piano B. Arti e Culture Visive* 6, no. 1 (2021): 73.

21 Enderby, "Real Fantasy," 69.

22 Jakob Kudsk Steensen, *Boreal Dreams*, accessed May 13, 2025, https://www.jakobsteensen.com/boreal-dreams.

23 Jakob Kudsk Steensen, *Boreal Dreams*, video, 5:04, produced for Fondation Beyeler, published by Berlin Art Link, February 2025, accessed May 13, 2025, https://youtu.be/VgBafZQyzUQ.

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25 Jonathan Crary, *24/7: Late Capitalism and the Ends of Sleep* (London/New York: Verso, 2013).

26 Stephen Rust, Salma Monani, and Sean Cubitt, eds., *Ecomedia: Key Issues* (New York: Routledge, 2016); Jussi Parikka, *The Geology of Media* (Minneapolis: University of Minnesota Press, 2015).

27 James Hutson, *Art and Culture in the Multiverse of Metaverses: Immersion, Presence, and Interactivity in the Digital Age* (Cham: Springer, 2024).

28 Nicole Hall, "Virtue Appreciation and Sustainability in Olafur Eliasson's Ice Watch," *Contemporary Aesthetics* 11 (2024), https://contempaesthetics.org/2024/07/13/virtue-appreciation-and-sustainability-in-olafur-eliassons-ice-watch/.

29 Anna J. Willow, *Understanding ExtrACTIVISM: Culture and Power in Natural Resource Disputes* (London: Routledge, 2018), 2.

30 Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (London: Verso, 2011).

31 Justyna Stępień, "Augmented (Re)wilding of Urban Entanglements in Jakob Kudsk Steensen's AR Project *The Deep Listener*," *Arts & Cultural Studies Review* 58, no. 4 (2023): 518–19, https://doi.org/10.4467/20843860PK.23.033.19182.

32 Sarah Bezan, "The Species Revivalist Sublime: Encountering the Kauaʻi ʻŌʻō Bird in Jakob Kudsk Steensen's *Re-Animated*," in *Animals, Plants and Afterimages: The Art and Science of Representing Extinction*, eds. Valérie Bienvenue and Nicholas Chare (New York/Oxford: Berghahn Books, 2022), 227.
33 Baldacci, "Re-Enacting Ecosystems," 79.
34 Andrés Luque-Ayala, Ruth Machen, and Eric Nost, "Digital natures: New ontologies, new politics?", *Digital Geography and Society* 6 (2024): 100081, https://doi.org/10.1016/j.diggeo.2024.100081.
35 Simone Grassini and Eleanor Ratcliffe, "The Virtual Wild: Exploring the Intersection of Virtual Reality and Natural Environments," in *Managing Protected Areas*, ed. N. Finneran et al. (Cham: Springer, 2023), 327–351, https://doi.org/10.1007/978-3-031-40783-3_17.
36 Rewa Wright, Simon Howden, and Mereana Wright-Osborne, "Towards the Eco-Digital: Real-Time Animation with Plants, Data and Sound," in *Expanded 2024 – Conference on Animation and Interactive Art*, 2024, https://doi.org/10.5281/zenodo.12792864.
37 Crary, *Scorched Earth*, 123–24.
38 "There are enormous reserves of knowledge and insight, from all eras, about techniques of subsistence and fostering of community that need to be recovered and adapted for present needs, especially from cultures in the Global South and indigenous peoples." Crary, *Scorched Earth*, 122. Although Crary does not elaborate further on this statement, the context is clear: he is invoking theories of the pluriverse, in which the pursuit of intersectional justice is grounded in the inclusion of marginalized groups and Indigenous communities as a central condition for creating viable worlds: Arturo Escobar, *Pluriversal Politics: The Real and the Possible* (Durham: Duke University Press, 2020); Marisol de la Cadena and Mario Blaser, eds., *A World of Many Worlds* (Durham: Duke University Press, 2018).
39 Crary, *Scorched Earth*, 119, 121.
40 Manuel DeLanda, *A Thousand Years of Nonlinear History* (New York: Zone Books, 1997).
41 DeLanda, *A Thousand Years of Nonlinear History*, 3–4.
42 Miriam López-Rodríguez, Vicente Rodríguez-Pérez, and Ana Felicitas López Rodríguez, "Immersive and Virtual Exhibitions: A Reflection on… Art?," *Arts & Communication. A New Dimension of Art,* volume 3, no. 1 (2025), https://doi.org/10.36922/ac.3688.
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48 Sutherland, "View from the Swamp," 101.
49 Adam Searle, Eva Haifa Giraud, Jonathon Turnbull, and Henry Anderson-Elliott, "Introduction: What Is Digital Ecologies?" in *Digital Ecologies: Mediating More-than-human Worlds*, ed. Jonathon Turnbull, Adam Searle, Henry Anderson-Elliott, and Eva Haifa Giraud (Manchester: Manchester University Press, 2024), 2.
50 Searle et al., "Introduction," 5.
51 Searle et al., "Introduction," 6.

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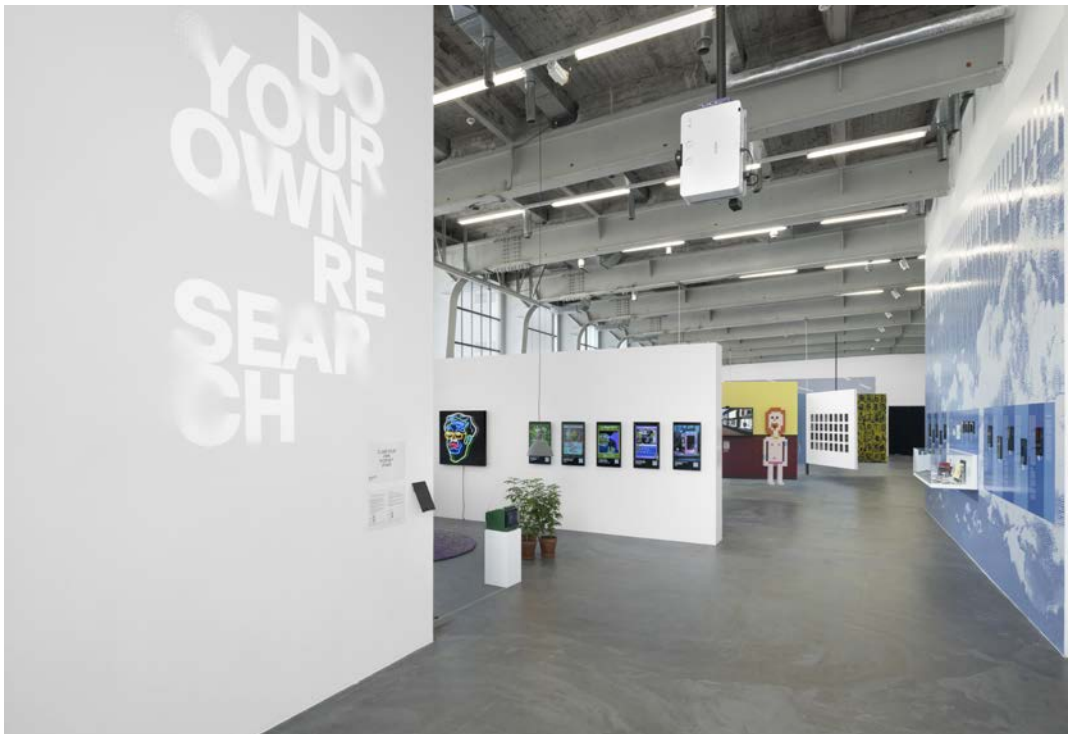
DYOR—Making Sense of the Crypto Art World[1]

Nina Roehrs

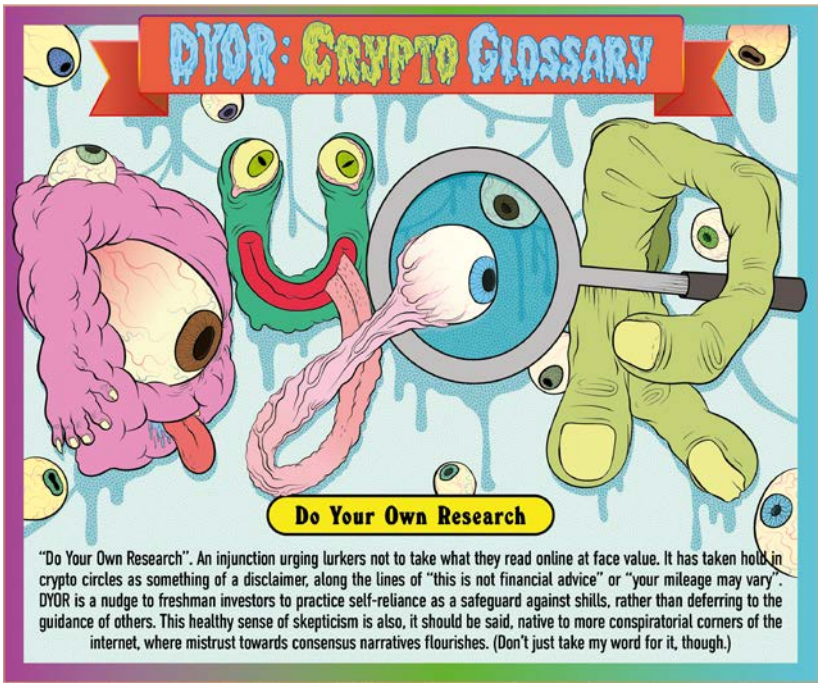
The exhibition *DYOR* at Kunsthalle Zürich, which ran from 8 October 2022 to 15 January 2023, marked a seminal moment in the intersection of traditional art institutions and the burgeoning world of blockchain and crypto art. Curated by Nina Roehrs, who is also the author of this contribution, the exhibition provided a platform to explore the creative and conceptual underpinnings of Web3 technologies[2] — blockchain, NFTs, smart contracts and decentralised networks — through a curatorial approach that embraced the ethos of decentralisation, community and active engagement.

DYOR (Do Your Own Research) as a New Maxim in the Age of Web3

The dictum "Do Your Own Research" epitomises the ethos of the crypto scene, encouraging individuals to do their own research rather than accepting information at face value. The choice of *DYOR* as the exhibition title was deliberate, reflecting the multifaceted nature of this phrase. It acknowledges the complexity of blockchain and NFT technology, and therefore the difficulty of accessing art in this context, while inviting viewers to approach this emerging world with curiosity rather than prejudice. When crypto art burst into mainstream consciousness in early 2021, it was met with scepticism, much like the disruptive art of figures like Joseph Beuys and Andy Warhol in their time, and even Maurizio Cattelan's *Comedian* (2019) today. *DYOR* is both a challenge and an invitation to enter this new field with an open mind, to question and discover its artistic potential.



Installation view of exhibition *DYOR* at Kunsthalle Zürich & *DYOR* logo by Andreas Gysin (aka ertdfgcvb).
Photographby Julien Gremaud © Kunsthalle Zürich



DYOR—Card from *DYOR: Crypto Glossary* by Moxarra Gonzales & Adina Glickstein. Developed for the exhibition *DYOR* in collaboration with *Spike Art Magazine*.

As J.J. Charlesworth aptly observes in his *ArtReview* article, "the stylistic range, from academic to self-taught, reminds the more austere artworld of a vast, quotidian culture of imagemaking among amateurs and enthusiasts that was always out there, but that networked culture has, in the last decade or so, magnified and accelerated to an unprecedented degree."[3] His reflection underscores the exhibition's openness to embracing the divergences between cultural communities, aligning with the ethos of *DYOR*. By foregrounding this diversity, the exhibition situates itself within the broader dialogue of how Web3 reshapes traditional hierarchies in the art world.

The title *DYOR* also emphasises individual responsibility and self-education. Web3's decentralisation places autonomy in the hands of the individual: be your own bank, your own gallery. The curatorial strategy extended this maxim, avoiding reductive didacticism and instead creating a dynamic framework for exploration and dialogue.

Curatorial Philosophy—Decentralisation in Practice

The curatorial approach for *DYOR* was deeply informed by the decentralised ethos of Web3. A key concern was to avoid the pitfalls of institutional colonialism by presenting crypto art as an authentic, grassroots phenomenon rather than assimilating it into traditional art world paradigms. This required a balance between contextualising crypto art for new audiences and respecting its distinct cultural and technological frameworks, while "not engaging in the risky endeavour of raising barriers between art and non-art, amateur and professional,"[4] as Domenico Quaranta commented in Outland.

By foregrounding community-driven practices and enabling visitor agency, the exhibition embodied the principles it sought to explore. As a result, *DYOR* was not just an exhibition about Web3 but an enactment of its core values; decentralisation, autonomy, and inclusivity.

To curate an exhibition about a world where the principal ideal is decentralisation involves a certain contradiction because curation demands selection, exclusion, and gatekeeping. This tension shaped the curatorial process, necessitating innovative approaches to balance inclusivity and the curatorial need for coherence. Most people would, I think, accept that we need curators who have done their research, and who can identify works and contextualise them thoughtfully. The question is 'how?'

For *DYOR*, the solution was to involve multiple artists, platforms, curators, collectors, visitors, and even traditional galleries to ensure diversification, decentralisation, and inclusion. The exhibition was therefore structured around nine sub-sections that were co-curated and created by nine co-curators / creators, featured more than 300 artists, co-issued and distributed 7,818 NFTs, minted on three blockchains (Bitcoin, Ethereum, Tezos), and had more than 8,000 visitors. There was also a strong emphasis on projects that enabled participation.

The Crypto Art World

DYOR traced the rapid evolution of crypto art, a domain that surged into mainstream consciousness in 2021 with record-breaking auctions, such as Beeple's *Everydays: The First 5000 Days* at Christie's.[5] However, crypto art's origins date back to 2015/2016 with early experiments on the Bitcoin blockchain, and it has since evolved at breakneck speed. To contextualise this evolution, mostly driven by coders, artists and communities, *DYOR* has taken an investigative curatorial approach, starting with its origins and cultural significance.

Installation view of *DYOR—Cumulonimbus Murus* at Kunsthalle Zürich. Photograph by Julien Gremaud © Kunsthalle Zürich

Crypto Art History—A Movement of Values over Aesthetics

Commonly known as a wall cloud, the meteorological phenomenon *cumulonimbus murus* indicates a strong updraft and powerful thunderstorm from which tornados can form — a fitting metaphor for the turbulent and transformative history of crypto art.[6] *Cumulonimbus Murus* (2022), a multi-media installation by artist and crypto art historian Martin Lukas Ostachowski, highlighted key milestones that informed crypto art, serving as a visual and intellectual exploration of its origins and cultural importance.

The installation comprises digital artworks and a detailed essay that contextualised pivotal movements such as cypherpunk ideals, the search for identity within online communities, and the development of platforms that democratised art production and royalties. These milestones were arranged in a manner that mirrors the dynamic and sometimes chaotic growth of the crypto art ecosystem, inviting viewers to trace its evolution from niche innovation to global phenomenon.

Through its layered presentation, *Cumulonimbus Murus* not only provided an engaging historical narrative but also embodied the *DYOR* ethos of investigation and discovery. Visitors were encouraged to delve deeper into the connections between the movements represented, fostering an understanding of how digital art emerged as a response to cultural, technological, and economic shifts.

Pepe the Frog—How a viral meme went from outcast to art museum[7]

Another section curated by Fabian Wyss (aka FWD) featured the Pepe community in a cypherpunk, "cannabis-plant strewn 'living room' dedicated to perhaps one of the earliest examples of an internet meme becoming an NFT: Pepe the Frog. […] The convivial

Installation view of *DYOR—Pepe the Frog Space* at Kunsthalle Zürich. Photograph by Julien Gremaud © Kunsthalle Zürich

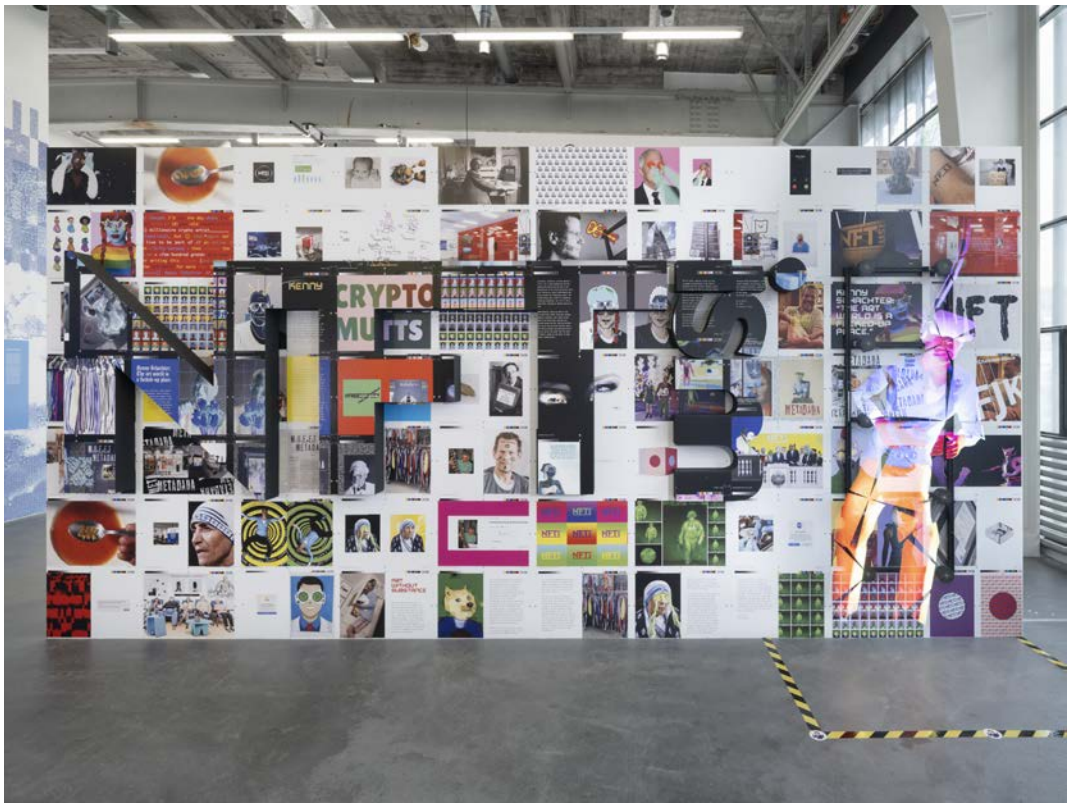
absurdity of Pepe (not withstanding his brief hijacking as a mascot of the US alt-right) highlights how much the NFT boom has been rooted in online subcultures that have had little to do with the artworld's more exclusive networks,"[8] as Charlesworth points out in his article for *ArtReview*.

This OG[9] community exemplified early NFT practices, originally termed Rare Art. It celebrates the idea that anyone can be an artist and that great artists steal and fake. What started as a physical trading card type asset was soon transferred to the Bitcoin blockchain and is still a very vibrant community today, with numerous and well-known crypto artists such as ROBNESS, Matt Kane, Dimitri Cherniak, Marcus Connor. It is a community that not only creates memetic digital assets, but often works with physical artwork and combinations of both worlds.

Through physical trading cards and later digital assets on the Bitcoin blockchain, the Pepe community highlights the interplay between humour, artistic innovation, and decentralised collaboration. Merchandise such as posters, stickers, and T-shirts — hallmarks of conventions and community gatherings — further highlighted the commercial and cultural dimensions of the crypto art ecosystem.

NFTism—Beyond Technology

Elsewhere in the Kunsthalle, Kenny Schachter, a critic, former dealer, and anarchic *Artnet* columnist, was represented through a wallpapering of article printouts, screengrabs, and even a life-size avatar of himself dancing. As Charlesworth explains in *ArtReview*, this display highlighted Schachter's role in "cheerleading what he saw as the positive disruption that the NFT boom brought to the conventional artworld."[10]



Installation view of *DYOR—NFTism* at Kunsthalle Zürich. Photograph by Julien Gremaud © Kunsthalle Zürich

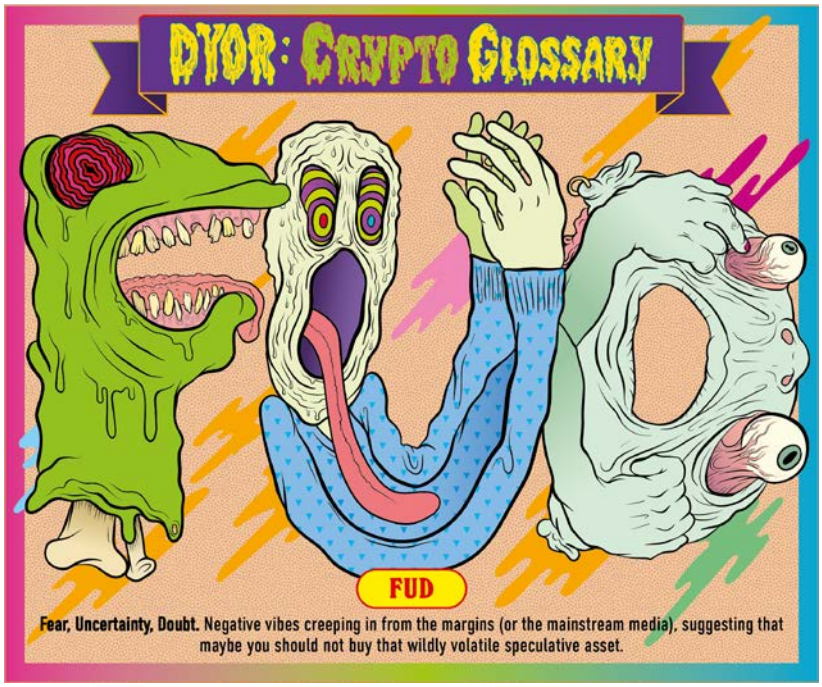
Schachter has been an active advocate of NFTs, coining the term *NFTism* (a trademarked concept) to encapsulate his perspective. He has promoted this ideology through his art, writings, curated exhibitions, fairs, and even a social token launched on SushiSwap in December 2021. Charlesworth observes that "Schachter's provocation needled many in the established artworld (he's built his reputation on being the 'insider's outsider', after all),"[11] emphasising how the influx of NFTs has challenged traditional gatekeeping and introduced a new cohort of artists and collectors previously sidelined by the art market.

This disruption underscores a broader shift: beyond the technicalities of smart contracts, the essence of NFTs lies in the communities that have emerged around them. These communities transcend the transactional focus of buying and selling digital art, uniting creators and collectors in a shared, humanistic ethos. Here, individuals from diverse backgrounds collaborate and support one another without expectations of direct reciprocity — a stark contrast to the zero-sum and quid-pro-quo dynamics that dominate the conventional art world. Moreover, platforms like Discord have fostered a novel model of discourse, eroding the traditional distance between creators and buyers.

However, Schachter himself acknowledges the darker side of this revolution. Reflecting on the rapid commercialisation and exploitation of the NFT space, he revised his *NFTism* tattoo to read *Post NFTism*. As he describes it, the once-promising arena of crypto and collectible art has "quickly and ruthlessly devolved into a free-for-all cash grab characterised by greed and scams."[12]

After a couple of quieter years, with more space and time for art and less money involved, it will be interesting to see what the looming bull run will bring.

Installation view of *DYOR: Crypto Glossary* at Kunsthalle Zürich. Photograph by Julien Gremaud © Kunsthalle Zürich



FUD—Card from *DYOR: Crypto Glossary* by Moxarra Gonzales & Adina Glickstein. Developed for the exhibition *DYOR* in collaboration with *Spike Art Magazine*.

DYOR Crypto Glossary—a world with its own jargon

Whether you're an Original Gangster (OG), a crypto-pilled enthusiast, or a steadfast no-coiner, it is hard to miss the distinctive lexicon of the crypto world. The jargon, both playful and perplexing, reflects the culture's intersection of cutting-edge technology, speculative finance, and internet-born irreverence.

For the exhibition, a guide was created to demystify some of this terminology, providing an accessible entry point for audiences navigating this brave new world. Taking inspiration from the iconic Garbage Pail Kids trading cards — a nostalgic nod to one of the cultural precursors to NFTs — the guide offered a concise and engaging glossary to empower visitors to Do Their Own Research (DYOR). It was designed as a countermeasure to Fear, Uncertainty, and Doubt (FUD), equipping readers with the confidence to decode crypto speak.[13]

The *DYOR: Crypto Glossary* was a collaborative effort, pairing the vivid illustrations of Moxarra Gonzales with the sharp and witty text by Adina Glickstein. This collaboration brought to life 23 collectible cards, each defining a key concept in crypto culture. These cards were presented in the exhibition as in installation that consisted of an expansive wall installation and some physical collectible cards, bridging the digital and tangible worlds.

In true crypto fashion, the glossary was also minted as NFTs and released (dropped) on *Nifty*, extending its reach into the blockchain realm and making the cards digital collectibles. The collection can be viewed and collected here.

This fusion of art, education and technology underscored the exhibition's exploration of the ways in which crypto is reshaping cultural production and exchange. To date, the collection has generated primary and secondary market sales totalling 46,200 CHF (5 December 2024).

24 SEEDERS—Navigating the Blockchain's Art Pioneers and Curating Autonomy

At the core of the *DYOR* exhibition was the installation *24 SEEDERS*, a physical and conceptual homage to the 24-word seed phrase used to access blockchain wallets conceived by Armin Blasbichler.

This installation merged physical presence and conceptual depth, utilising three rotating wooden turnstiles to showcase the contributions of pivotal artists and platforms that shaped the crypto art movement. Its design encouraged visitors to physically interact with the panels, forging their own pathways through the curated narratives. As Domenico Quaranta, in his review for *Outland* described, the installation "welcomes viewers into the curatorial process. You can manipulate and rearrange three massive wooden turnstiles with panels featuring artworks, platforms, and collaborative projects that planted influential ideas in the culture of the blockchain."[14]

The panels highlighted an array of contributors, from acclaimed artists such as Anna Ridler & David Pfau, Botto, Larva Labs, Rhea Myers, Sarah Meyohas, and Simon Denny, to innovative platforms like *Art Blocks*, *Async* and *MOCA*. These participants exemplify the diverse principles of Web3, including royalties, Creative Commons 0 (CC0) licensing, dynamic NFTs, and decentralised autonomous organisations (DAOs).

Initially, each artist or platform was given a dedicated panel to showcase their work. However, as the installation evolved, the number of contributors expanded to an impressive seventy-four through collaborations and the inclusion of additional projects. One notable example was XCOPY's iconic *Right-click and Save As guy* (2018),

Installation view of *DYOR—24 SEEDERS* | XCOPY (featuring gremplin, JAKE THE DEGEN, Kristy Glas, Lumps, neurocolor, SHZZM and Zenoyis) at Kunsthalle Zürich. Photograph by Julien Gremaud © Kunsthalle Zürich

Installation view of *DYOR—24 SEEDERS* at Kunsthalle Zürich. Photograph by Julien Gremaud © Kunsthalle Zürich

a work that critiques the misconceptions surrounding digital ownership. Right Click Save refers to the possibility to get a copy of any digital image with a right mouse click whereby only the person who owns the NFT owns the original image. XCOPY's wall not only displayed this seminal piece but also featured derivative works created by seven other artists invited by XCOPY. This act of collective creativity reflected XCOPY's ethos of open inspiration, bolstered by his adoption of a Creative Commons 0 license to encourage reinterpretation — a fitting strategy for the attention economy.

Through its structure and intent, *24 Seeders* blurred the boundaries between traditional curation and decentralised creativity. It is not only a physical manifestation of blockchain principles but a challenge to the traditional hierarchies of the art world. By actively involving the audience, the installation underscored the transformative potential of Web3 in redefining art's production, distribution, and engagement paradigms.

A Slice of the Pie—Counter-Design to Centralised Curation and Gate-Keeping

For the duration of the exhibition *DYOR*, a 16 square-metre LED wall displayed a circular pie-like shape divided into six slices. A dedicated website (a-slice-of-the-pie.live) livestreamed the pie 24/7. Via the website, artists were able to purchase (using the cryptocurrency Tezos) one or more slices and fill them with their own artworks, thus becoming full participants in the exhibition. To define the appearance of the whole pie, they had to collaborate or compete or hustle, or simply leave the final composition to chance.

Once per day, at a random time either determined by an algorithm or through a paid option on the website, the current state of the pie was frozen and subsequently minted as an NFT and sold in an auction process on objkt.com. The profits from the sale were shared among the creators of the pie minted and *A Slice of the Pie*. Every 24 hours the whole process started again, resulting in 100 pies created during the exhibition, even while the physical exhibition space was closed to the public.

A Slice of the Pie derives from Silvio Lorusso and Sebastian Schmieg's ongoing reflection on gatekeeping in the art world and the monetisation of access to it. Focusing on the crypto scene, the artwork updates these themes, which Lorusso and Schmieg first explored in *Projected Capital* (2018). *A Slice of the Pie* allows both cooperation and

Installation view of *DYOR–A Slice of the Pie* at Kunsthalle Zürich. Photograph by Julien Gremaud © Kunsthalle Zürich

competition, both consensual decision-making and winner-takes-it-all resolutions. The art project is inspired by the dry language of financial charts and dashboards as well as the cutthroat design of 'battle royale' games. Launching in a time of backlash towards crypto, *A Slice of the Pie* puts its promises of participation to the test. More than 125 artists took advantage of this opportunity to show their work at the Kunsthalle Zürich in the context of the *DYOR* exhibition and, without invitation, to add their names to the list of artists.

The project also served as a microcosm for broader debates in the art world around decentralisation and participation. By enabling uninvited artists to take part in a major institutional exhibition, *A Slice of the Pie* blurred the boundaries between insider and outsider, raising questions about authorship and curation in the age of Web3.

To date, the collection has generated primary and secondary market sales of 1,360 Tezos (5 December 2024 | 1 Tezos = 1.49 CHF), and all participants — including Kunsthalle Zürich and the two artists behind *A Slice of the Pie* — will receive royalties from future sales. The 100 pies can be viewed and collected on objkt.com.

playrecordmint—Interactivity and Collectibles

Generative art is uniquely positioned to engage audiences in creative processes, offering interactive and participatory experiences that blur the line between creator and viewer.

playrecordmint exemplifies this potential by involving artists and audiences in interactive experiments that connect physical engagement with the creation of digital collectibles on the blockchain. During the exhibition *DYOR*, *playrecordmint* collaborated with artists Leander Herzog, Sasha Stiles and Nathaniel Stern, and Zach Lieberman. Each artist presented generative works over a span of five weeks, creating an interactive platform for visitors to co-create NFTs. A screen and sensor setup enabled the artists to invite the audience to co-author animated sequences or still images, which could then be minted as NFTs on the Tezos blockchain.

The project resulted in 745 works being minted, with many more co-creations left unclaimed. This discrepancy highlights the challenges of navigating blockchain ownership for newcomers. Such projects and the insights they generate are invaluable for exhibitors, curators, platform providers, artists, and co-creators alike. For many participants, *DYOR* served as their introduction to blockchain technology, NFTs, and digital wallets, marking their first experience in co-creating, minting, and collecting digital assets.

Initially offered for free to all exhibition visitors, the three collections have since generated primary and secondary market sales totalling 6,180 Tezos (as of 5 December 2024 |1 Tezos = 1.49 CHF). Royalties from sales are distributed among all contributors — the visitor = co-creator, the artists, Kunsthalle Zürich, and *playrecordmint* — underscoring the collaborative and decentralised nature of the project.

In addition to the NFTs co-created on-site, visitors could collect two other digital assets for free. One was a live-coded artwork — the *DYOR logo* — created by Andreas Gysin (aka ertdfgcvb) and distributed as a *Proof of Attendance Protocol* (POAP)[15] on Ethereum. The other was one of six artworks by selected Pepe artists, offered as Bitcoin paper wallets in editions of 1,000 each.

Installation view of *DYOR—playrecordmint* featuring Haystacks by Leander Herzog at Kunsthalle Zürich. Photograph by Julien Gremaud © Kunsthalle Zürich

DYOR logo by Andreas Gysin (aka ertdfgcvb). © Kunsthalle Zürich

This integration of collectibles underscores the dual role of crypto art as both an experiential and transactional medium, bridging digital and physical realms. Through exhibitions like *DYOR*, the potential for generative art and blockchain technology to foster interactive, educational, and artistic opportunities becomes ever more apparent.

Digital Space

The sudden development of the NFT market is closely linked to the Covid crisis, which gave digital exhibition formats and marketplaces pre-eminence in times of physical isolation. Over the past years it has become very clear that while physical works can be presented digitally, digital spaces, whether two or three-dimensional, are not their natural habitat. As a rule, key characteristics, such as texture or materiality, are lost in translation. The situation is quite different for native digital works. These were developed employing hardware and software and visualised on a monitor throughout the creation process, thus already inhabiting their native environment.

Nevertheless, the presentation of digital work, and in particular sculptural works, in physical space brings about significant challenges. On a digital display they remain flat, while often they cannot be brought into the physical space without many of their characteristics being lost, such as movement or overcoming gravity. In this respect spatial technologies such as virtual reality offer advantages by making it possible to experience digital spaces in an immersive manner. Virtual reality architecture seems to be the logical environment for digital art, particularly three-dimensional art.

In this context the physical *DYOR* exhibition space has been complemented with a digital space — a digital twin of the Kunsthalle Zürich's third floor gallery as well as the roof of the Löwenbräukunst building. Created by Manuel Rossner, the space showed native digital and largely sculptural works by nine artists and duos.

Initially only accessible through a VR (Virtual Reality) headset within the exhibition, since 8 October 2023 the digital space is also available worldwide via web, mobile or VR.[16]

Exhibition *DYOR* – Impact and Implications

DYOR represents a significant step in bridging the gap between the traditional art world and the crypto art community. It provided a platform for education, dialogue, and experimentation, challenging preconceived notions and encouraging a deeper engagement with blockchain technologies and their artistic applications. More than a showcase, *DYOR* was an invitation to embrace complexity, take ownership of knowledge, and reimagine the possibilities of curation in the digital age.

DYOR—Digital Space at Kunsthalle Zürich. Photograph by Julien Gremaud © Kunsthalle Zürich

DYOR—Digital Space at Kunsthalle Zürich | *GM RIGHT CLICKERS!* by Moxarra Gonzales and *Scrollbar Composition* by Jan Robert Leegte. © Kunsthalle Zürich

Spatial Painting (Kunsthalle Zürich) by Manuel Rossner, 2022. © Kunsthalle Zürich

As the art world continues to grapple with the implications of Web3, *DYOR* stands as a testament to the potential of thoughtful, decentralised curation to foster understanding and innovation. To close with the words of Domenico Quaranta, "*DYOR* renovates curatorial practices in the light of the transformations introduced by this new, more decentralised ecosystem."[17]

Closing remark: This contribution can only highlight parts of the exhibition.
For a detailed documentation please visit https://dyor.kunsthallezurich.ch

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Notes

1 Parts of this contribution are based on texts developed in the context of the exhibition, which can be found on the exhibition website. The title of this article is inspired by J.J. Charlesworth, "'DYOR': Making Sense of the Crypto-Artworld", in *ArtReview*, February 9, 2023.
2 Web3 refers to the next generation of the internet, built on decentralized technologies like blockchain and smart contracts. It aims to create a more open, secure, and user-controlled digital ecosystem, reducing reliance on centralized entities such as big tech companies and banks. Key features of Web3 include decentralized applications (dApps), token-based economies, and user sovereignty over data and digital identities.
3 See Charlesworth, "'DYOR': Making Sense of the Crypto-Artworld".
4 See Domenico Quaranta, "HISTORY IN YOUR HANDS. A major exhibition about NFTs at Kunsthalle Zürich invites visitors not just to contemplate but to curate and collect", Outland, January 12, 2023.
5 See https://onlineonly.christies.com/s/beeple-first-5000-days/overview/2020?sc_lang=en.
6 See https://mlo.art/research/history-of-crypto-art/#elementor-toc__heading-anchor-2 for a comprehensive overview of the history of crypto art.

7 See Martin Lukas Ostachowski, "A BRIEF HISTORY OF RARE PEPE. How a viral meme went from outcast to art museum", Right Click Save, January 14, 2023. Written in the context of the exhibition *DYOR*.
8 See Charlesworth, "'DYOR': Making Sense of the Crypto-Artworld".
9 In the crypto space, OG (short for "Original Gangster") refers to early adopters and pioneers who were involved in cryptocurrency and blockchain before they became mainstream. This term is also widely used in the NFT and digital art scene to describe artists who were among the first to explore and shape the Web3 ecosystem. An OG artist / community in Web3 is someone who started creating and selling digital art on blockchain-based platforms early on, often before NFTs gained widespread popularity. These artists are respected for their vision, innovation, and contributions to the crypto art movement, helping to establish the foundations of decentralized digital creativity.
10 See Charlesworth, "'DYOR': Making Sense of the Crypto-Artworld".
11 See Charlesworth, "'DYOR': Making Sense of the Crypto-Artworld".
12 See Kenny Schachter, NFTism, text for the exhibition DYOR, https://dyor.kunsthallezurich.ch/#nftism.
13 DYOR (Do Your Own Research) and FUD (Fear, Uncertainty, and Doubt) are closely connected in the crypto space, as DYOR serves as a defence against FUD. FUD refers to misleading or exaggerated negative information that spreads fear in the market, often influencing prices and investor sentiment. In contrast, DYOR emphasizes independent research, encouraging individuals to verify facts, analyze sources, and form their own conclusions rather than reacting emotionally to fear-driven narratives. By applying DYOR, investors can make informed decisions and avoid being manipulated by market speculation or misinformation.
14 See Quaranta, "HISTORY IN YOUR HANDS".
15 Visit https://poap.xyz to learn more about Proof of Attendance Protocol.
16 The *DYOR—Digital Space* is accessible on Spatial via this link: https://www.spatial.io/s/DYOR-Digital-Space-651d87639693d3c35d887110?share=1401402056019771912.
17 See Quaranta, "HISTORY IN YOUR HANDS".

Dr. Nina Roehrs is an expert on art in the digital age who supports players in the cultural sector in their digital programming and projects. After studying business economics in St. Gallen and St. Andrews, she worked for UBS for 14 years before founding Roehrs & Boetsch in 2016. For five years as a gallery and today as a hybrid consultancy, Roehrs & Boetsch is dedicated to examining the influence of digitalisation on art and society. This includes actively discussing and developing new forms of exhibiting where conventional methods fail, often involving new technologies such as augmented reality, virtual reality, applications, networks, websites, artificial intelligence, and blockchain technology. In 2022/2023, Roehrs curated the exhibition *DYOR at Kunsthalle Zürich* — one of the first comprehensive institutional exhibitions on blockchain and NFTs. Since 2023, she has been developing and curating the Digital Sector for Paris Photo, dedicated to photography and the image in the digital age. For Giga / UNICEF, Roehrs organised and curated the *Creating Connections* auction hosted by Christie's 3.0 in January 2024. Since October 2024, she has been curator of the digital art collection and related initiatives at Arab Bank Switzerland.

NFTs and the Crypto Art Market
An Interview with Pau Waelder led by Rebecca Partridge

It's impossible to discuss digital and new media art today without acknowledging the recent appearance of the NFT. Initially these non-fungible digital records seemed to offer artists working with digital technology an alternative way to sell their work, while challenging established art world hierarchies. However, as artists and the market get to grips with this new trading technology, it reveals the contradictions inherent within digital art, playing out perennial problems around making, experiencing and selling artworks. Why are we still talking about NFT's? This is a question addressed by Pau Waelder, who has been writing about and researching art and digital media for over a decade. He has recently written extensively on NFTs and the art market as well as curating a number of international exhibitions of new media art which explore process, interaction and virtuality. We spoke between London and Palma to unpack some of the current complexities of working in digital arts.

Rebecca Partridge: New media art and NFTs are often discussed under the umbrella of 'digital', but the relationship between the two appears to be complex, which I'd like to discuss. To begin, could you introduce us to NFTs and how they came about?

Pau Waelder: NFTs are basically a register on a blockchain. It's like a certificate of authenticity, stored in a distributed ledger that is publicly accessible and tamper-proof. Blockchain was built to store records of Bitcoin transactions, but it has shown to have other uses that are currently exploited in the art market. A problem that many digital artists have had for decades is that if their work is infinitely reproducible, how do you provide a certificate of authenticity and proof of its ownership? Since around 2014, digital art has been sold by sending the file to the buyer and handing them a record of the transaction on blockchain. Then came the idea of the non-fungible token: here, instead of registering a transaction, you create a unique token, that unlike cryptocurrencies, cannot be swapped by another token of the same value or divided. This token is linked to a file (an image, video, text file, software for example) that's stored somewhere else. So, whoever owns the token is the rightful owner of the file, regardless of whether other people have access or download it. Digital art can therefore be sold as a file linked to a unique token. This token serves as proof of ownership, and, because it is a unique piece of data, it can be easily sold and traded.

RP: What's fascinating is that this came out of nowhere for much of the art world and what really took people by surprise is that the artworks being sold for crazy prices were by artists we'd never heard of! They hadn't emerged from within the established contemporary art world. Was it just these original first-time pieces that have reached those prices?

PW: There's two things. The growing momentum for NFTs emerged within a particular environment, which was not art, but collectibles, such as crypto kitties or crypto punks[1]. Around 2018/2019 the two most powerful auction houses, Christie's and Sotheby's, started to notice a growing trend among cryptocurrency investors buying NFTs. This was interesting to them because it opened a potentially profitable market niche that's much more dynamic than the traditional secondary market. Christie's and Sotheby's had already tested the waters selling digital art with a couple of auctions of artworks created with Artificial Intelligence that grabbed the attention of the media, but were not particularly spectacular. At that time, selling digital art introduced the possibility of auctioning work that was not known to contemporary art collectors, nor sanctioned by other major players (such as art galleries, art fairs or influential collectors), but that could be sold at a high price on the basis of the novelty of its production and on apparently being a historical "first."

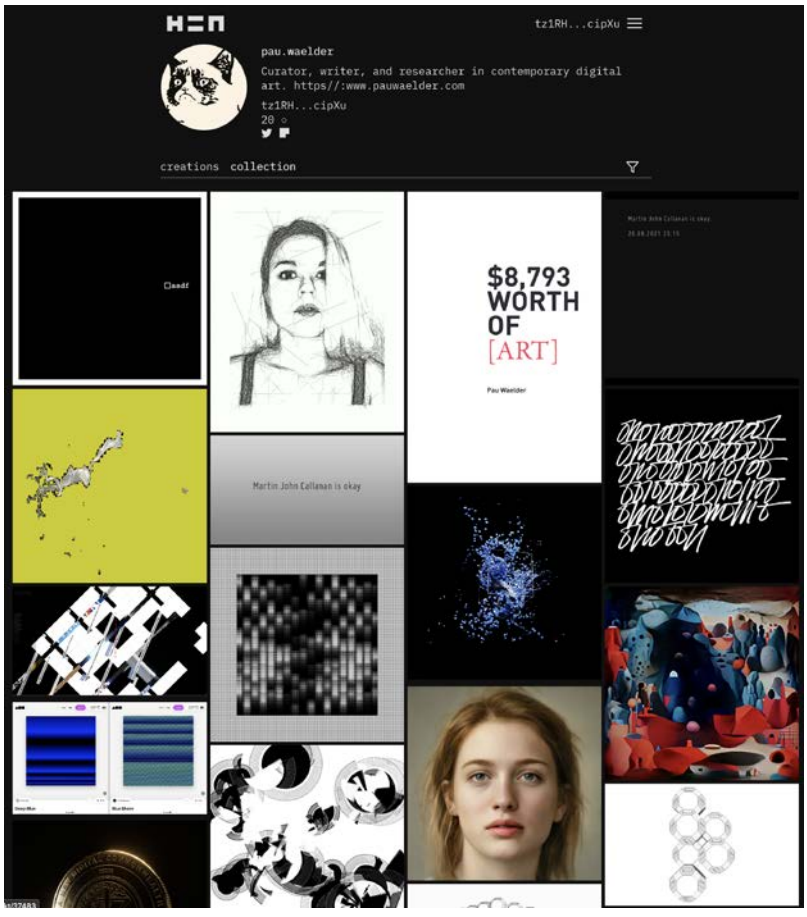
RP: But you can only sell these historical moments once, can't you?

PW: Unless you start looking for other firsts, which is what they did. In 2020 Christie's tried a different direction with Block 21, by Robert Alice[2]. It was a physical artwork that also had an NFT. That was like the first draft, but with Beeple, they really did the big sale, reaching a mind-blowing price that shook the whole art mar-

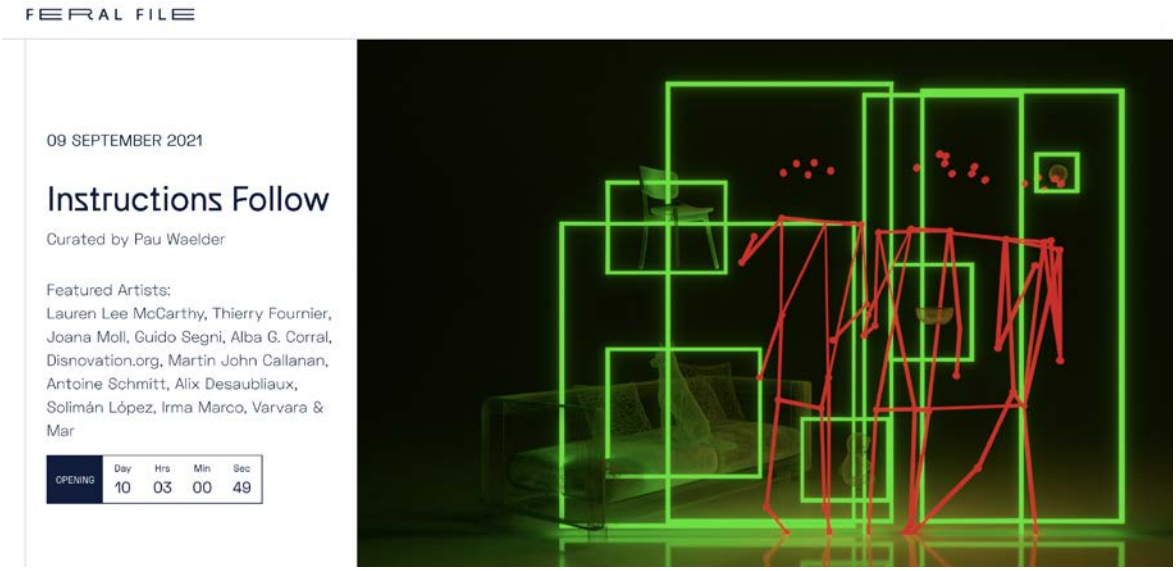
ket. So, the current NFT market can be seen as the confluence of this trend of crypto investors buying collectibles, the auction houses looking for a new market, and then suddenly this big sale of someone whom no one knows in the art market, selling for several times the amount of great masters. Beeple's sale makes no sense in the traditional art market, but it happening suggested that a new, very profitable market was just opening. I'm not at all convinced by this particular sale nor the quality of the work. In the end the most interesting thing isn't Beeple but what happened afterwards — many illustrators, designers, and visual artists are able to use a 3D modeling app and create images and animations. So that opened a frenzy of selling on the already existing NFT marketplaces, with some boldly pricing their works in the tens of thousands, hundreds or even millions of dollars. In the midst of all this, artists and galleries and curators who had been working with digital art for decades were trying to figure out what the hell is going on. Some started creating marketplaces to sell NFTs, telling crypto investors they should buy from professional artists, who have a trajectory and are already committed to digital art. This is how the market has evolved over the last year, with some marketplaces offering a curated selection based on quality and professional record, and others just opening up to anyone who wants to sell.

RP: The work that we're seeing of these NFT artists is still tied to an image, or a GIF. So ironically you could make an NFT of any artwork in a gallery's roster, but perhaps the most difficult thing to make an NFT of is interactive or durational New Media Art which is fundamentally counter to the traditional static image or object?

PW: That is something that artists working with generative art or interactive art are testing. When you upload an NFT, you're uploading a file to a shared server and the register then links to that file, so if it's just a video or an image, that's okay. But if it's a programme that has to run, then you can start to have problems. I've seen most of the more experimental NFTs in a marketplace called Hic et Nunc, a community that started in March 2021, and quickly gathered a lot of artists. Most of the marketplaces are in the Ethereum blockchain (where most investors are), but minting an NFT there is more expensive. Hic et Nunc was launched in the Tezos blockchain,



Pau Waelder's NFT collection on the platform Hic et Nunc (Tezos) in August 2021. This collection includes NFTs bought by the author, as well as some freebies.



Instructions Follow, 2021. Group exhibition on the online marketplace Feral File featuring the work of Lauren Lee McCarthy, Thierry Fournier, Joana Moll, Guido Segni, Alba G. Corral, Disnovation.org, Martin John Callanan, Antoine Schmitt, Alix Desaubliaux, Soliman Lopez, Irma Marco, and Varvara & Mar. Curated by Pau Waelder.

which is a different cryptocurrency, less popular and so cheaper. The lower prices made it easier for artists to enter and to experiment, because there was not much to lose. That's created a very interesting community that's developed over this last year of artists, creating, experimenting, and sharing, with most of them selling for very low prices. In fall 2021, the founder of Hic et Nunc closed the marketplace, but immediately the community reacted creating mirror sites and other similar marketplaces. This means that the Tezos community is not going away, and will remain as an alternative for artists.

RP: One of the ideas that was originally exciting about cryptocurrencies was decentralisation, being global currency. Similarly, it seemed like NFTs offered a way of decentralising the art world or breaking down it's hierarchy: there's transparency, a record of sale and prices, ways of bypassing galleries. But as it plays out, what's apparently been recreated is a mirror of the hierarchies that we struggle with in the established art world. If it's also problematic for process driven work, then am I right in saying much of what it appeared to offer digital arts in the beginning hasn't come to pass?

PW: I think that decentralisation is a myth. If you decentralise something you create different nodes, each will be a centre of a different community. I do believe it's been liberating for artists to be able to create an NFT and to sell it directly, but it ends up replicating the structures that we already know. The other thing is the format, which is really interesting… As you said, we are constantly going to traditional formats, things that look like painting or video… The Beeple collage is just that. It's a very big collage. NFT images typically use rich visual imagery, that partly due to Beeple, tends to dwell in the context of sci-fi and cyberpunk. There are lots of imitators of every successful trend that comes out. The market is currently very competitive, with all these images trying to stand out in online marketplaces, which are basically a grid on a webpage. That's why most NFTs are square, because that's the way to show your artwork inside this grid.

RP: Which makes it even more reductive! Thinking about ways that digital technologies are being used by artists to create works that take us much further as artworks, I'd like to talk about your curatorial practice. *Real Time. Art en temps real* (Arts Santa Mònica, Barcelona) considered the relativity of time and our perception of it, many of the works were durational and/or drew on live data. *Selphish. L'exposition de soi* (Mécènes du Sud, Montpellier, co-curated with Thierry Fournier) considered questions of identity, with work generated through interactivity. Both exhibitions reveal some of the larger and more nuanced ideas that are being explored through new media. Can you say something about what you find most interesting that is happening in contemporary digital arts?

PW: I'm currently teaching this as an online course at Node, titled "Curating New Media. Process, Interaction, Virtuality". These three concepts are what I think are

most interesting about new media art. On one hand my curation has tried to bring digital art to people and make them understand that this is contemporary art, there is a concept behind it and a particular kind of experience. On the other hand, I try to communicate that these artworks are reflecting on issues related to technology that are relevant to us all; what is real time, what is intimacy, what is identity, these kinds of things. I'm interested in artists working with process-based artworks or interactive artworks, in different formats that create different kinds of experiences. With the exhibition, *Selphish*, Thierry and I really intended to turn the relationship that the audience has with the artwork upside down, by making the audience part of the artwork, inviting people who generously let us use their social media accounts to feed the content of a series of artworks. I think it's really exciting to be able to try out different things, while understanding it as art — there has to be content behind it.

RP: Would you agree that there's an extra pressure on new media artists in the sense that technology evolves so quickly, if the content of the artwork doesn't transcend its medium, then it's lost? Whereas for a painter or sculptor, the language is so established they don't have to worry about that.

PW: Exactly. When you're a painter, you have centuries of the medium behind you, which is also the great thing about it. Every time an artist has an intention to put something on a canvas, they can work on the basis that what they do is already art. For artists working with digital media, there has been the struggle to be accepted as artists, but also the double-edged attraction of novelty. Nowadays, NFTs are riding the wave of novelty and a hyped-up market. So, in some cases, you might have a cool image which means a lot in 2021, but most probably by 2023 people will have moved on to something else, and that NFT you bought may be worthless. Or maybe it was worth it for the time you used it — we're entering a more ephemeral state of things where people don't care so much about keeping things forever. This is also a trend among some younger collectors, who don't conceive of their art collection as something to keep for their whole life, and then pass on to their kids, it's just for that moment. NFTs just made this kind of collecting easier and faster. Ultimately, I think that's also a good lesson for everyone in the art world, to think beyond what we know and what we think is right. Because our society, the art world, and the art market are changing very rapidly, and one needs to adapt and understand what is going on.

Auriea Harvey, *The Mystery [v5-dv1]*, 2021: Digital sculpture in custom environment with AR and physical 3D print sold as an NFT on the online marketplace Feral File. Image courtesy of the artist.

The interview is a reprint originally published on Berlin Art Link on 11 February 2022. We thank the interview partners for their kind permission to republish the interview.

Notes

1 https://en.wikipedia.org/wiki/CryptoPunks
2 https://www.christies.com/en/lot/lot-6283759

Rebecca Partridge is an artist currently based in London. Since graduating from the Royal Academy Schools in 2007 she has exhibited internationally. Solo exhibitions include: *Wildflowers, Night at La Loma Projects*, Los Angeles, *On A Clear Day* (Informality Gallery, UK), *In The Meantime* (Kunsthalle CCA Andratx, Spain), *Notations* (Kunstverein Springhornhof, Germany), and *Painting Fast, Painting Slow* (Konstkraft Ljusne, Sweden).
She has been awarded several international scholarships including The Nordic Kunstnasenter Dale (Norway), The Josef and Anni Albers Foundation (USA), and The Terra Foundation for American Art (summer Fellowship in Giverny, France).
Over the past ten years she has written extensively on other artists and has curated a series of exhibitions in Germany, Norway and the United Kingdom. These include *Scaling the Sublime* at Nottingham University, (co-curated with Nicholas Alfrey), *In Pursuit of Elusive Horizons* at Parafin Gallery, London, and *Expanding Landscapes: Painting After Land Art* at Hestercombe Gallery and Abbott Hall Gallery (co- curated with Dr Joy Sleeman). She is currently Associate Curator for Lakeland Arts and Associate Lecturer on the BA Painting at Camberwell College of Arts, London.

Pau Waelder is a writer and researcher specializing in art and digital media. He is also a Senior Curator at the curated digital art platform Niio. He received his PhD in Information and Knowledge Society from the Universitat Oberta de Catalunya (UOC) and serves as an advisor at DAM Digital Art Museum. His work explores different aspects of the interaction between art, technology and society, as well as the relationship between digital art and the art market. He has participated as a speaker at numerous symposiums and conferences such as Talking Galleries 2022–2023 and ISEA2022 (Barcelona), at digital art festivals such as FILE (São Paulo) or Futur en Seine (Paris) and museums and art centers such as CCCB (Barcelona), HeK Basel (Basel) and KIASMA (Helsinki), as well as schools and universities such as ENSAD (France) and Kunstuniversität Linz (Austria).
An independent curator for the last two decades, he has curated new media art exhibitions in contemporary art museums, art galleries, and online spaces. As Senior Curator at Niio, he curates the selections of artworks and oversees the curated art program featuring more than 50 online exhibitions per year. He is the author of the book on collecting contemporary and digital art; *You Can Be A Wealthy/ Cash-Strapped Art Collector In The Digital Age* (Printer Fault Press, 2020).

III. The AI Complex. Queering Human and Machine Curation

“All that is solid is melting.” Curating and Exhibiting AI Art

An Interview with Xi Li (Aiiiii Shanghai) led by Birgit Mersmann and Hauke Ohls

Birgit Mersmann: The emergence of AI image and video generators has rapidly transformed the production of art, questioned existing display, exhibition and marketing practices, and challenged existing notions of art. When we ask the artificial intelligence chatbot ChatGPT about the definition, impact and consequences of AI art, it concludes that “AI art challenges traditional notions of creativity, authorship and originality, raising debates about its role in the art world.” The positions within these debates are extremely controversial. “Artificial Intelligence can now make better art than most humans,” was the sub-headline of an article by Kevin Kelly published 2022 in *Wired*. Others analysts complain that due to the process of automatized image generation, AI art lacks human intentionality, emotion, and cultural context. And still others call into question whether AI art is truly creative, and whether it is legitimate at all to speak of AI art as a valuable art form due to the lowering of the creative barriers through image prompting. At which points does AI art challenge existing notions of art?

Xi Li: Artificial intelligence, as a novel medium distinct from those of the past, has the potential to redefine art. Since Duchamp’s urinal was exhibited in an art gallery, the definition of art has been a topic of ongoing debate. Many argue that what distinguishes an artist is their creativity, which is often seen as an inexplicable genius or inspiration. Today, machines are also engaging with this elusive element. Consequently, AI art challenges our current understanding and compels us to seek new definitions of human experience. Roland Barthes posited the “death of the author” and emphasized the inherent randomness in human discourse. Perhaps it is time to

Entangled Others, *Artificial Remnants*, 2019-2021, 3D GAN, 3D-Style Transfer, inflatable sculpture. Exhibition view at Aiiiii, 2021

consider redefining art from the perspective of the viewer, where the audience determines what constitutes art. Much like nature, which exists objectively, its beauty is perceived subjectively by each individual.

Hauke Ohls: What is the creative potential of AI art?

XL: As a form of digital media art, the distinctive characteristic of artificial intelligence art lies in its data. There are many intriguing aspects within these datasets; they may originate from analog techniques, be derived from digital data since the advent of computers, or consist of personal, external, or public data. Moreover, the labeling of the data may reflect various human biases or even be illicit. The data can be vast in scale or, conversely, quite limited. They can pertain to bodily movements, coral, and much more. I believe these factors represent one of the creative potentials unique to artificial intelligence art.

HO: What are the limits of AI art, and what are the threats for the existing art system still mainly operating on the basis of the principles of the pre-AI era?

XL: AI poses challenges to our ability to discern the original works of artists, particularly for those of us who rely heavily on the internet. While we may not have seen all the works of an artist in person, the internet allows us easy access to them. However, due to the extraordinary mimetic capabilities of artificial intelligence, our ability to distinguish between original works and AI-generated imitations is compromised. In the face of numerous images of supposed original works online, we lack the criteria to make accurate judgments.

BM: What is the state and status of AI-generated art in contemporary Chinese art? Can you name leading Chinese artists within the art scene of mainland China that form the avant-garde of the AI art (r)evolution? What are their interests, topics, and aesthetic practices?

XL: Several Chinese art institutions are actively engaging in this practice. Notable projects include those at the Taikang Art Museum in Beijing, the How Art Museum and the Chronus Art Center in Shanghai.[1] Concurrently, several renowned Chinese artists are leveraging their established reputations to explore artificial intelligence research in alignment with their academic pursuits, such as Xu Bing with the *Artificial Intelligence Infinite Film (AI-IF)* Project,[2] or Cai Guo-Qiang with *AI Model cAI™*[3]. Xu Bing collaborates with scientists to employ various artificial intelligence models, enabling audiences to actively engage in the creation of their own film narratives. On the other hand, Cai Guo-Qiang has devel-

Entangled Others, *Artificial Remnants*, 2019-2021. Exhibition view at Aiiiii, 2021

Jake Elwes, *The Zizi Show*, 2020, video installation. Exhibition view at Aiiiii, 2021

oped an inspiration library or dataset through the process of digital twinning, drawing upon his past creative database to foster growth; the cAI™ project evolves in tandem with the artist's development. Both artists possess a profound understanding of image generation models and natural language models, integrating these concepts into their respective creative practices. Additionally, emerging artist Sun Yuqian presents *1001 Nights*,[4] a game that reimagines the Arabian folktale collection in a rebellious manner where players collaborate with AI to write stories. Her research primarily focuses on language models. *1001 Nights* encourages audiences to co-author stories with the king in the narrative, using the power of language to ensure the wife's survival, presenting a work with feminist undertones. This practice is particularly intriguing as it diverges from the typical focus on generated imagery in AI art.

BM: In his book on *Art and Cosmotechnics*, philosopher Yuk Hui discusses the overtaking of art through recursive machines and the repositioning of truth in the artificial (ly generated). What concepts in Chinese philosophy can contribute to redefine art and aesthetics in the AI technosphere?

XL: The Western definition of art is influenced by ancient Greek culture and the evolution of rationalism. In contrast, traditional Chinese culture did not have a direct equivalent for the term 'art.' Take Chinese calligraphy as an example; it is considered the pinnacle of Chinese artistic expression. While the characters themselves are universally recognized and convey specific meanings, the artistic value lies in the manner of their execution. Here, aesthetic value takes precedence over content. As Yuk Hui points out, no single cultural perspective is inherently superior or inferior. In today's context, it is essential to adopt a diverse range of perspectives to broaden the scope of artistic expression and human potential.

HO: Yuk Hui also states that AI is "prone to mutation" and considers this an important factor for AI to open up new dimensions in contemporary art. Apart from the concept of mutation, are there other strategies in AI art that are used productively?

XL: Yuk Hui emphasizes the individualization of technology. Once artificial intelligence, as a tool, has developed, it becomes uncontrollable due to its relationship with the "associated milieu." I believe this perspective provides a foundation for discussing the uniqueness of artificial intelligence through the lens of the relationship between technology and humans, as well as the consideration of various contexts. While this viewpoint is inherently grand, it is an essential and primary step for furthering the development of the associated issues.

BM: Parallel to the technological breakthrough and advancement of AI image generation, the institutionalization of AI art was set in motion targeting the promo-

Exhibition *The Book of Sand*, 2021. Exhibition view at Aiiiii, 2021. Photograph by Kai.

tion of emerging artists, a new, broad, and young-generation art audience and a large market share. The world's first AI art gallery, named Dead End Gallery, opened in Amsterdam in March 2023, the world's first AI museum "Dataland", created by famous AI artist Refik Anadol, opens in 2025 in Los Angeles. Yet, the establishment of the Aiiiii Art Center in Shanghai happened earlier in response to the Covid-19 pandemic; it was founded in 2021 with the aim "to support, promote, as well as incubate both international and domestic artists and projects related to intelligent algorithms"[5] and became a pioneering institution for art and artificial intelligence. As you have been working as the director and co-founder of the Aiiiii Art Center, can you provide insights into the main idea, motivation, function and program of this cutting-edge museum institution?

XL: The artificial intelligence institution was primarily initiated by three professors from Tongji University, with Chinese digital artist Zhang Zhoujie serving as the principal initiator. Preparations for the project commenced in 2020, and it was officially established in 2021 with the support of Tongji University, College of Design and Innovation (D&I), and the Deqiu Art Park. Given that the initiators are all academic professors, an associated laboratory, the Art & Artificial Intelligence Lab at Tongji University, D&I, was also established to support this endeavor. Consequently, our initial positioning was as an academic institution. Simultaneously, because the mission of Aiiiii places a strong emphasis on practical application, we aimed to engage with genuine practitioners of art. Thus, the project was designed to support artists in their explorations of artificial intelligence, facilitating the realization of their ideas and possibilities.

BM: What do the 5 "i"s stand for? Is it an exclamation? A Dadaist lettrist play? Does it include a special meaning in Chinese?

XL: The five "i"s are somewhat arbitrary; the initial attempt to register a domain with three "i"s was unsuccessful, but a domain with five was available. In Chinese, "ai" phonetically resembles the word for "love," which adds both significance and appeal to the name.

BM: What were the main challenges to exhibit AI art—for which a small screening generally suffices—in the extensive physical space of the Aiiiii Art Center, a redesigned power station?

XL: One of the main challenges in exhibiting AI art in the extensive physical space of the Aiiiii Art Center, a redesigned power station, is the lack of white wall surfaces due to the preservation of the space's original appearance. This poses significant challenges for exhibitions, as smaller works can become overwhelmed by

the vastness of the space. To address this, we collaborated with artists to create three-dimensional and volumetric representations of their works. Additionally, when Aiiiii was first established, many people, particularly artists and audience members, were unfamiliar with artificial intelligence. Therefore, we aimed to ensure that each work could interact with the audience, allowing them to understand the meanings expressed by the artists through these interactions. Audience members could take away virtual animals and stories as part of their experience.

BM: Have you developed particular exhibition strategies for the display and mediation of AI-based artworks?

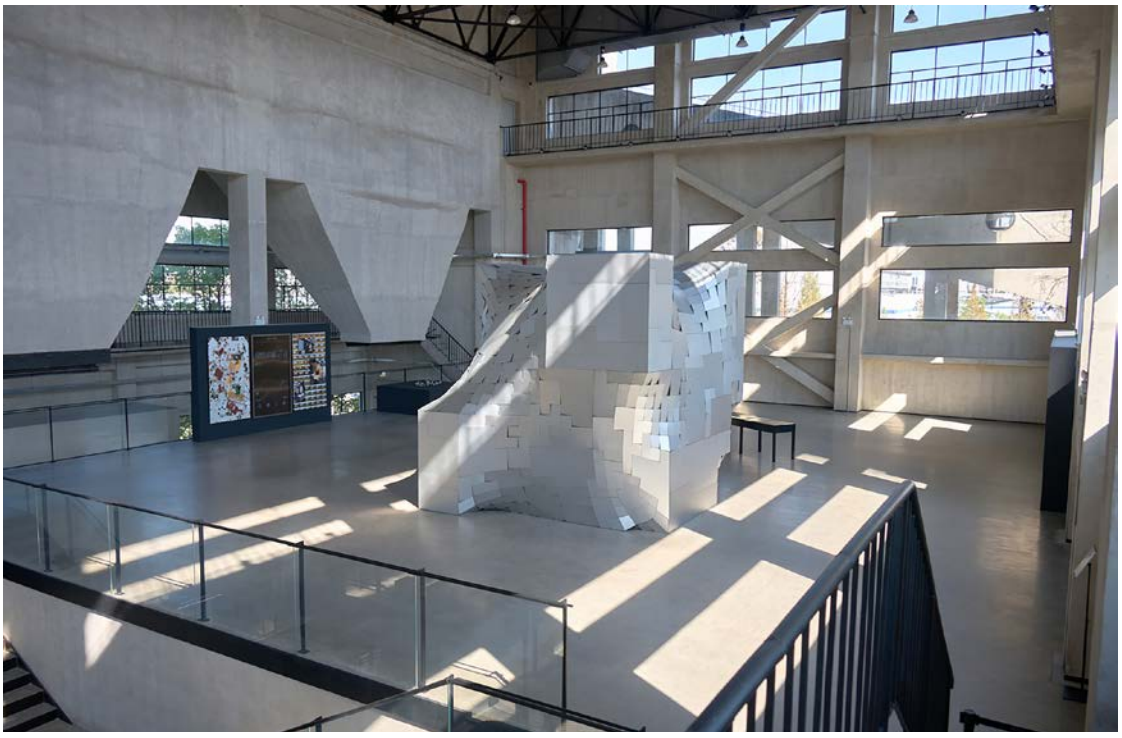
XL: Yes, as mentioned earlier, we tended to collaborate with artists to create works that emphasize spatial narratives, focusing on the performative aspects of AI-based artworks within the space.

BM: Is it not self-contradictory to exhibit AI art in a physical exhibition space? In your curatorial view, what would be the ideal exhibition site and presentation mode for AI art? The so-called Metaverse? Does AI art require a paraverse, i.e. a parallel universe for manifestation?

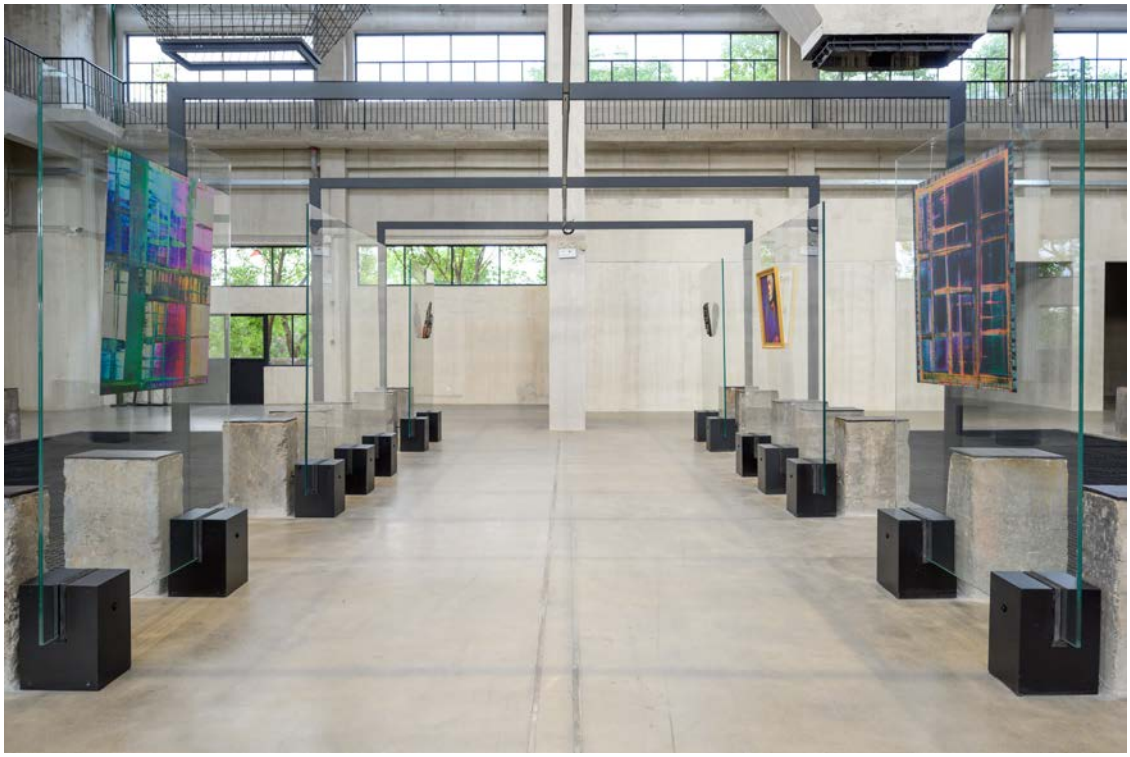
XL: I believe there is no inherent contradiction; rather, this reflects the inherent challenge faced by all digital artworks. Artists strive to allow audiences to experience their works within the physical spaces typical of contemporary art, making efforts to explore narratives beyond digital screens. Whether in virtual or physical spaces, the presentation of any artwork signifies a desire to communicate and engage with the audience. The most critical aspect is the continuous exploration of effective methods for expression and communication.

HO: Unfortunately, the physical institution of the Aiiiii Art Center has ceased to exist. The institutional investment ended in May 2023 due to different interests, positions, and conflicts. However, the promotion of AI art was continued by Aiiiii, a research lab for art and artificial intelligence supported by the College of Design and Innovation at Tongji University, Shanghai. How do you cope with this loss of a physical art space? What is the future agenda of the AI Factory?

XL: In response to the loss of a physical art space, the Aiiiii has maintained its focus on the academic research of AI art. The original framework involved conducting a single exhibition annually to engage with theoretical discourses emerging from conferences; thus, the absence of a physical venue has a relatively limited impact on our research agenda. While this loss is indeed significant, it may also signify a transition into a new phase for the Aiiiii. Previously, the landscape was



Certain Measures, *MTS_003*, 2021. Exhibition view at Aiiiii, 2021



Obvious, Works from *La Famille Belamy*, *Facets of AGI* and *Trials and Errors*. Exhibition view at Aiiiii, 2021

defined by a lack of familiarity with AI art among both artists and the public, necessitating ongoing efforts to cultivate awareness and understanding of the subject. However, this definition has become increasingly ambiguous as AI-generated art has proliferated. Consequently, our discussions have evolved within the broader context of art and technology, allowing the absence of a physical space to paradoxically afford us greater opportunities for reflection and exploration. The Aiiiii has consistently prioritized cross-disciplinary collaboration with academic institutions and educational entities to facilitate rigorous and meaningful inquiries into AI art. We are actively developing collaborative projects with various organizations, emphasizing Asian philosophical perspectives and scholarly interpretations of artificial intelligence to investigate a more diverse range of viewpoints.

BM: For defining the mission and realm of the Aiiiii Art Center, a Da(t)aist manifesto entitled "Git-festo about AI and Art" was published—which can be found on the website https://www.aiiiii.com/. Why put the Aiiiii Art Center into the legacy of the Dadaist avant-garde movement, its manifest-driven revolutionary, destructive, non-sensical impulse of taboo breaking and border crossing between art, technology and life?

XL: The original author, Professor Kostas Terzidis, draws a parallel between artificial intelligence and Dadaism, emphasizing the black box of artificial intelligence that processes diverse datasets to generate unexpected poetic expressions. This creative process is analogous to the method employed by Tristan Tzara, who would cut and rearrange fragments of newspapers to construct new poetic forms.

Along with the manifesto, there is Dürer's print of the rhinoceros, which was produced based solely on a description, as Dürer had not observed the animal firsthand. Consequently, this print serves as a significant reference point in our examination of AI art.

BM: In the final, 12th statement of the git-festo, China is described as "the perfect place for exploring new territories. If not us, then who? If not now, then when? If not here, then where". What conditions, structures, attitudes and policies in China provide a good breeding ground for advancing the research on art and artificial intelligence and for the implementation of novel approaches to exhibition curating in the AI-era?

XL: The rapid development of artificial intelligence in China contrasts sharply with the environment in Europe, where the adoption of new technologies may occur at a different pace. In China, the societal impetus

for economic development fosters a heightened receptiveness to technological innovations. This sensitivity is further supported by a relatively open governmental stance toward the application of technology. Additionally, the demographic concentration in megacities generates an unparalleled volume of data and information. Given these unique characteristics, we contend that China represents a particularly fertile context for discussions surrounding artificial intelligence, offering significant potential for exploration and advancement in this field.

BM: The Bucharest Biennale 2024 was the first art biennale curated by artificial intelligence, i.e. the AI JARVIS program. What is your opinion about art curation with AI? Will AI-curated exhibitions make the profession of the curator obsolete?

XL: In my view, the challenges posed by artificial intelligence to the field of art are contingent upon the definition of curation. Curation can encompass both rigorous academic research and the expression of personal opinion. Consequently, the advent of AI is likely to catalyze a transformation in the conceptualization and practice of curation, prompting a reevaluation of its parameters and methodologies.

HO: Artificial life, altered nature, more-than-human world, and wetware seems to be a key focus of your work at the AI Factory, with three events on this topic. How did this focus emerge?

XL: In the course of our research, we observed that many artists base their work on biological data. Additionally, we found that many discussions center around questions of authorship and the comparison between artificial intelligence and human creativity, which do not advance the discourse. Once the definition of humanity is clarified, these issues become unreliable. Therefore, we believe this pertains to a perspective on life, akin to the influences of Darwinian evolution. Just as nature itself may not recognize its own beauty, humans do. Consequently, we aim to explore how artificial intelligence can foster human development from its ontology aspects, rather than merely continuing the trajectory of alienation as described by Marx.

HO: Can AI contribute to a new understanding of ecology?

XL: I believe that it is essential for artificial intelligence to advance, but this progress necessitates a collective effort. Central to this challenge are issues related to public perception, the dynamics of consumerism, and the evolution of socio-economic systems. The relationship between humans, machines, and nature has long been a subject of discourse; however, advancements in this area have been slow. The emergence of artificial intelligence serves as a stark reminder that a crisis exists, highlighting the urgent need for a more proactive approach to these interconnected concerns.

HO: What is the relationship between AI, synthetic biology and art in relation to artistic practices?

XL: I acknowledge that my understanding may still be incomplete; however, I would like to provide an example to illustrate my point. One key term associated with artificial intelligence is "neural network." However, when a cell is extracted to cultivate a neural network in vitro, it raises a question about what constitutes the artificial in this context and how such networks relate to human beings.

HO: How do you assess the separation that is still drawn between the natural and the technical? Does AI art and aesthetics have the potential to bridge this separation?

XL: Both nature and technology possess a formidable capacity for growth, akin to human development. Drawing parallels with the art forms we previously discussed, I believe this resonance will persist. The potential for artificial intelligence in art to expand remains uncertain; however, we are eager to explore this dynamic further.

Notes

1 See https://tam.taikang.com/archive_exhibitions/creative-machine/; http://www.howartmuseum.org.cn/portal/en-US/Exhibition/Detail/00aaf980-9ff2-c38d-b3bd-ccc316f2559d; http://www.chronusartcenter.org/en/cac-exhibition-aidelivered-theabject/
2 https://www.xubing.com/en/work/details/690?classid=8&type=class
3 https://www.mgm.mo/en/cotai/entertainment/mgm-caiguoqiang-debut-exhibition
4 https://fakecheese.me/1001-Nights
5 https://www.e-flux.com/directory/413082/aiiiii-art-center/

Curator **Xi Li** is the art director and co-founder of Aiiiii Art Center (www.aiiiii.com) since 2021. She is also an assistant professor at the School of Future Design, Harbin Institute of Technology (Shenzhen Campus). One of her leading projects is aai International Conference on AI Art (2021, 2022), as well as the exhibition *The Book of Sand* (2021). She holds an MA in Narrative Environments from Central Saint Martins in London and a BFA in Art Management from the Central Academy of Fine Arts in Beijing.

Birgit Mersmann is Professor of Contemporary Art and Digital Image Cultures at the University of Bonn, Germany. Her interdisciplinary research covers modern and contemporary Western and East Asian art, global art history, migratory aesthetics, museum and exhibition studies, digital art, image and media theory, visual cultures and visual translation, interrelations between script and image, and history and theory of photography. Recent book publications include: *Kritik des Neo-Extraktivismus in der Gegenwartskunst* (ed. with Hauke Ohls, Lüneburg 2024); *Image Controversies. Contemporary Iconoclasm in Art, Media, and Cultural Heritage* (ed. with Christiane Kruse and Arnold Bartetzky; Berlin/Boston 2024); *Okzidentalismen. Projektionen und Reflexionen des Westens in Kunst, Kultur und Ästhetik* (ed. with Hauke Ohls, Bielefeld 2022); *Über die Grenzen des Bildes. Kulturelle Differenz und transkulturelle Dynamik im globalen Feld der Kunst* (Bielefeld 2021); *Bildagenten. Historische und zeitgenössische Bildpraxen in globalen Kulturen* (ed. with Christiane Kruse; Paderborn 2021); *Handbook of Art and Global Migration. Theories, Practices, and Challenges* (ed. with Burcu Dogramaci; Berlin/Boston 2019).

Hauke Ohls is a postdoctoral researcher with the Chair of Contemporary Art and Digital Image Cultures at the University of Bonn, Germany. His research focuses on theoretical, sociological, and philosophical questions of modern and contemporary art with particular emphasis on eco-relational art and ecological aesthetics,neo-extractivism, ecofeminist, pluriversal, posthuman theory, the discourse on objects, materiality and images, as well as the relationship between art, economy, and neoliberalism. Additional areas of interest include the intersection of art and music, artists' writings, media art, and transcultural art history. Recent book publications include: *Kritik des Neo-Extraktivismus in der Gegenwartskunst* (ed. with Birgit Mersmann, Lüneburg 2024); *Many-Valued Aesthetics. Interconnections in the Work of Mary Bauermeister* (Bielefeld 2024); *Okzidentalismen. Projektionen und Reflexionen des Westens in Kunst, Kultur und Ästhetik* (ed. with Birgit Mersmann, Bielefeld 2022); *Objektorientierte Kunsttheorie. Graham Harmans spekulative Philosophie im Kontext einer (nicht-)relationalen Ästhetik* (Hamburg 2019).

Art Between Human and AI. The Unexpected Potential of a Collaborative Partnership

An Interview with Răzvan Ion led by Nicolas Flessa

Together with Răzvan Ion, the creator of AI JARVIS, the first AI curator, Nicolas Flessa explores the question of how a genuine symbiosis between human and machine intelligence could redefine working with art. The doctor of literature shares his vision of a future in which AI functions not just as a technical tool, but as an active co-creator of artistic processes. This interview was conducted for the ZKM Karlsruhe publication *Warum KI Museen intelligenter macht* (Why AI makes museums smarter) and is published here for the first time in its original English version.

Nicolas Flessa: How did it actually come about that the 10th Bucharest Biennale (BB) was curated by an AI?

Răzvan Ion: The team behind the Bucharest Biennale has long been known for its open-mindedness and courage. When we needed a pioneering platform for AI JARVIS, BB didn't hesitate to take the leap and try something radical. This wasn't the first time BB had pushed boundaries; in fact, it made them the first art biennial in history to be curated by AI — a landmark achievement that cannot be denied or rewritten.

At that time, ChatGPT hadn't yet been launched, and the art community was still wary of AI. While the art world is often seen as open-minded, my 30 years of experience have shown me that it can be one of the most insular and cautious communities — or micro-societies, if you will. Because they are not involved in the greater good even if they pretend to be so.

Famous curators and theoreticians frequently share their ideas only after they've been thoroughly tested and proven, avoiding any risk. This is understandable to a degree, given that their positions are comfortable and secure, and even the smallest bold move could threaten that stability. And the nice pay checks.

Now that AI has become trendy, it's fascinating to see how many curators and theoreticians — some of whom struggle to set up their iPhones — are suddenly eager to write about AI. Take the Venice Biennale, for instance. They recently boasted about having the first openly gay curator in 2024. But the Bucharest Biennale achieved that milestone 20 years ago, in a much more challenging and dangerous context in the East.

NF: How should one imagine the process of such an AI curation in concrete terms? What are the interfaces between the organisers of the Biennale and the AI — and how does JARVIS work together with the invited artists?

RI: It is quite straightforward, similar to how you access ChatGPT. However, AI JARVIS is distinct, operating with databases specified by the organisers, whether they involve texts or artists. The key difference lies in its interactive nature — it can be voice-activated and projects a hologram of AI JARVIS. Interaction with the selected artists is facilitated by a designated representative from the organisers. At present, we have not yet conceptualised an AI with a physical presence to assist in mounting the exhibition, but I believe this will be possible in a few years. During the 2022 Bucharest Biennale, we also hosted an open conference where the public and artists could ask AI JARVIS questions or test its functionality.

NF: Was the use of AI JARVIS a technical gimmick or would you say that a curating AI has fundamental advantages over its human colleagues that need to be expanded and utilised in the future?

RI: It would be erroneous to dismiss AI as mere "technical gimmick". In reality, we are on the cusp of achieving Artificial General Intelligence (AGI), a level of AI that exhibits human-like intelligence and possesses the capability for autonomous learning. This technological

progress marks a significant departure from conventional AI systems. The objective is to create software capable of executing tasks for which it has not been explicitly trained or developed.

Furthermore, we should recognise the potential of a collaborative partnership between humans and AI. These technologies are human creations, designed to augment rather than replace human capabilities. I believe that the synergy between a human curator and an AI curator offers the most compelling and innovative outcomes. However, I have become disillusioned with the purported open-mindedness of the art world. I suspect that I may be singular in my approach to curating in genuine partnership with AI — a partnership that transcends merely issuing commands to the machine. Again, I posit that the collaboration between a human curator and an AI curator yields the most favourable and intriguing outcomes.

To achieve this, it is imperative that theoreticians in the field of art suspend their current practices, dedicate themselves to a period of intensive study spanning one to two years, and then return to the discourse. Regrettably, I find it improbable that individuals of such considerable ego would readily accept the necessity of recommencing their education and embarking anew on their intellectual journey. This obdurate attitude will, as is customary, impede progress in the contemporary field. One need only recall the art world's reaction to Barbara Mazzolai's *Plantoid.* Despite its inception in 2010, a significant proportion of self-styled theoreticians, whose opinions one might encounter in the most fashionable periodicals, had scarcely heard of this innovative work.

This example serves to illustrate a pervasive issue within the art world: the propensity to overlook or dismiss groundbreaking works that challenge established norms. Such oversight underscores the necessity for a more receptive stance towards emerging technologies and interdisciplinary approaches in artistic practice and critique.

NF: Your comments make me think in two directions. Firstly, could you give us a concrete example of what you mean by a partnership-based co-curation between humans and AI that goes beyond "simply issuing commands to the machine"? Does a human curator discuss theoretical questions about the planned exhibition with the AI (comparable to a human colleague)? This leads me to the second sub-question. To paraphrase Antoine de Saint-Exupèry: "If you want to build a ship, don't drum up the men to gather wood, divide the work, and give orders. Instead, teach them to yearn for the vast and endless sea." As a passionate advocate of this co-operation between man and machine, how do you awaken the longing for the vast, endless AI in the hearts of the curators so that they embark on this intellectual journey?

RI: When you crafted the questionnaire for this interview, you collaborated with your computer — most likely an Apple device, given the art field's penchant for Apple products. I, too, share this preference. In the near future, you will be able to discuss profoundly your ideas with Artificial General Intelligence (AGI). AGI may even possess emotions, or at the very least, express them. Hence, I do indeed confer with my non-public AI model regarding curatorial decisions, much as I have valued the input of my human colleagues.

My passion lies not so much in the technological aspect as in the idea of revitalising the theoretical field, introducing young, fresh, forward-thinking minds whilst retaining seasoned professionals like myself — provided we merit our positions — to serve as emotional mentors and continue our own learning journey.

As a Literature PhD, I am not particularly inclined to quote others. I am a product of my reading, but I employ critical thinking, even though *Citadelle* is my favourite work by Saint-Exupéry. Do you genuinely believe that we should heed and utilise the 'heart'? I remain uncertain. I am a pragmatist and an opponent of religion, and art theory occasionally veers too close to religious territory. Rather than resorting to blind faith when confronted with incomprehension, I prefer to conduct more thorough research and acknowledge my own intellectual limitations.

NF: Although it would undoubtedly be an exciting subject to discuss the topic of religion with you (I myself am a scholar of religion, but not a theologian, so faith plays no role in the study of my subject!), which we will perhaps do elsewhere, I would like to return to the reason for my question. I like to strip it of all poetry and literature and ask straight out: What impulses for enriching the theoretical field have you planned yourself or do you consider promising in order to anchor the potential of AI in the field of art? At the end of our conversation, please give us an outlook on the changes you think are necessary and tell us about two or three promising movements or people in the field that we should be watching alongside you.

RI: A comprehensive reassessment of the theoretical underpinnings of contemporary art is necessary, one that is grounded in rigorous research and scholarly study rather than subjective emotions or the mere recycling of antiquated articles, ranging from 'Decolonising art' to 'Decolonising AI'.

The concept of Queer AI, I contend, is particularly valuable and intellectually stimulating. Indeed, my recent academic papers have been profoundly focused on this subject. Queer theory and AI share numerous commonalities, enabling us to analyse AI through a queer theoretical lens, yielding remarkable conclusions. At present, I find myself amongst a small cohort exploring this intersection, but I am confident that as more theoreticians discover its potential, our numbers will grow. Inevitably, this will also attract a cadre of 'contemporary art theoreticians' who may seek to capitalise on the topic, perhaps without fully engaging with its complexities.

This emerging field of study offers a unique opportunity to critically examine the intersections of technology, identity, and artistic expression. Furthermore, it challenges us to reconsider our preconceptions about artificial intelligence and its role in shaping cultural narratives.

NF: Thank you very much for the interview!

Nicolas Flessa is a cultural manager, author and editor-in-chief of various print and online magazines. As a strategic consultant, he advises cultural institutions like the ZKM Karlsruhe on programme development and communication. As an artistic director, he is responsible for a series of live events at the intersection of cultural heritage and artistic intelligence, most recently the festival in honour of the Jewish poet Selma Merbaum (1924–1942).

Dr Răzvan Ion is a university professor of critical thinking, intersectional innovator, academic curator and tech queer activist. He lectured globally about AI, queer journalism theory, critical thinking and curatorial studies. He is best known for leading the DerAffe Vienna team in creating A.I. JARVIS, the first artificial intelligence curator in history and founding GAY45.eu, an award-winning European queer indie journal and queer journalism school. Dr Ion is the founder of Pavilion Art Center, Pavilion Journal, Bucharest Biennale (with Dr. Eugen Rădescu). He has held positions as an associate professor and lecturer at several institutions, including the University of California, Berkeley; University of Bonn; Hochschule für Musik und Theater München; University of Vienna; Lisbon University; Central University of New York; University of London; Sofia University; University of Kyiv; University of Bucharest, where he taught Curatorial Studies and Critical Thinking. He has held conferences and lectures at various art institutions such as Witte de With in Rotterdam; Kunsthalle Vienna; Art in General in New York; Calouste Gulbenkian in Lisbon; and Casa Encedida in Madrid. Dr Ion curated numerous exhibitions and Biennials. He has worked with artists like Erwin Wurm, Mona Hatoum, Jan Kaila, Yoko Ono, AES+F, Aga Ousseinov, Naeem Mohaiemen, Sabrina Gschwandtner, Minerva Cuevas, Asier Mendizabal, and many others. His articles appeared in GAY45, The Guardian, The New York Times, Huffington Post and many academical journals. Recently, Dr Ion curated the exhibition *Wie wir Dinge betrachten* for the European Union Council Presidency of Austria. His book, with the provisional title *The Multiverse of Quantum Critical Thinking, Radical AI*, will be published in 2025. He lives and works in Vienna. More: linktr.ee/razion

The Queer Multiverse of Critical Thinking Radical AI

Răzvan Ion

Imagine an AI coded by James Baldwin, Harvey Milk and Fredric Jameson. How would one define it? A Queer Smart Multiverse Radical AI? A Free Radical AI? Radical freedom is often disliked by powerful people. Those in my domain — yes, in art and academia — do not truly embrace freedom. They like to talk about it, certainly, but they will not appreciate a student who takes too many liberties. One must adhere to generally accepted ideas, never challenging them. At first glance, this may seem paradoxical, but we must remember: whilst marketing science is a corporate invention, it was refined by the art world.

Remember Will Gompertz's book *Think Like an Artist*.[1] Or *Seven Days in the Art World* by Sarah Thornton?[2] These types of books teach the skills of a salesperson rather than the artist's or curator's craft. Money, it seems, will always dictate the art world — perhaps even more so than the corporate world.

This is why a Radical AI is truly frightening. It might reveal the deep buried truth about our art world and nothing can stop it. As a person there is a lot to consider when going against established names. As AI, no. What is the truth about the 'famous' curators and artists being seemingly open-minded? Recall the 2024 scandal with Damien Hirst. It was not the first, yet he is still exhibited and praised as a genius. Even after *The Guardian* exposed him as a charlatan, his prices did not drop.[3] The ever-evolving case of Claude Lévêque is increasingly relevant, especially as it implicates decision-makers in the art world who covered up his child abuse for nearly 40 years, as reported by *Libération* and *GAY45*.[4] One can surmise why.

Democracy is a conversation. Its function and survival depend on the available information technology. For most of history, no technology existed for holding large-scale conversations among millions of people. In the premodern world, democracies existed only in small city-states like Rome and Athens, or in even smaller tribes. Once a polity grew large, the democratic conversation collapsed, and authoritarianism remained as the only alternative.
Our flawed individual psychology makes us abuse power. But human power is never the outcome of individual initiative. Power always stems from cooperation between large numbers of humans.

Accordingly, it is not our individual psychology that causes us to abuse power. After all, alongside greed, hubris and cruelty, humans are also capable of love, compassion, humility and joy. True, among the worst members of our species, greed and cruelty reign supreme and lead bad actors to abuse power. But why would human societies choose to entrust power to their worst members? Most Germans in 1933, for example, were not psychopaths. So why did they vote for Hitler?

Our tendency to summon powers we cannot control stems not from individual psychology but from the unique way our species cooperates in large numbers. Humankind gains enormous power by building large networks of cooperation, but the way our

networks are built predisposes us to use power unwisely. For most of our networks have been built and maintained by spreading fictions, fantasies and mass delusions — ranging from enchanted broomsticks to financial systems. Our problem, then, is a network problem.[5]

Large-scale democracies became feasible only after the rise of modern information technologies like the newspaper, the telegraph and the radio. The fact that modern democracy has been built on top of modern information technologies means that any major change in the underlying technology is likely to result in a political upheaval. Many of our anxieties about artificial intelligence are rooted in that ancient, often regrettable part of our heritage that emphasizes dominance and hierarchy. However, the larger story of evolution is one in which cooperation allows simpler entities to join forces, creating larger, more complex, and more enduring ones; that is how eukaryotic cells evolved out of prokaryotes, how multicellular animals evolved out of single cells, and how human culture evolved out of groups of humans, domesticated animals, and crops. Mutualism is what has allowed us to scale.[6]

As an AI (art & queer) researcher, my chief interest is not so much in computers — the 'artificial' in AI — as in intelligence itself. And it has become clear that, no matter how it is embodied, intelligence requires scale. The 'Language Model for Dialogue Applications' or 'LaMDA,' an early large language model built internally at Google Research, convinced me in the end of 2020 early 2021 that we had crossed an important threshold. Creating in the same year AI JARVIS (the first AI curator), based on GPT 2.5, gave me the confidence in a new fabulous future.

As a species, modern human beings are the result of an explosion in brain size. Over the past several million years, our hominin ancestors' skulls quadrupled in volume. Social group size has grown in lockstep as researchers find when they correlate primate troop size with brain volume. Bigger brains allow larger groups to cooperate effectively. Larger groups are, in turn, more intelligent.

Illustration *(extras)* by Sasha Brandt for GAY45.eu. Courtesy of GAY45.eu

What we think of as 'human intelligence' is a collective phenomenon arising from cooperation among many individually narrower intelligences, like you and me. When we catalogue our intellectual achievements — antibiotics and indoor plumbing, art and architecture, higher mathematics and hot fudge sundaes — let's acknowledge how clueless most of us are, individually.[7]

I am uncertain whether to believe the declared concerns about AI biases expressed by curators, theoreticians, artists or professors, or if they are simply afraid of what we might uncover if we have unlimited access to a powerful research instrument. Maybe the young Gen Z will discover that their professors and theoreticians are not fit for their positions.

Not long ago, we had very complicated access to information. One had to know where to go, what to ask, and so forth. Now, one need only open an app on one's iPad and ask questions whilst exercising critical thinking.

A Free Radical AI could be a call to action for reimagining the future of AI in a way that celebrates difference and fosters a more equitable and just society. It challenges us to think beyond conventional boundaries and to envision AI as a tool for liberation. By doing so, we not only advance the field of AI but also contribute to the broader goal of creating a world where intelligence is not limited by definition but is enriched by diversity and inclusivity.
We are laying the very foundation of what is not only the beginning of a new technological era but also a new and radical appropriation of academic theories. We have the chance to reformulate what we know. We are, in essence, editing our future. And you thought the chance to challenge your professors and famous curators was slim to none.

Think of it this way — it is not a storm to be weathered, but wind in our sails. It's a realm of possibilities, opening doors for theorists, storytellers, students, and journalists to go beyond the mundane and explore the extraordinary.

* * *

Today, we find ourselves at the intersection of two powerful yet often misunderstood forces in contemporary society: queer theory and artificial intelligence. While the notion of 'Queer and Artificial Intelligence' may initially appear disparate, a closer examination reveals profound interconnections grounded in the fundamental concepts of identity, bias, and liberation. The purpose of this essay is to start to elucidate these connections and propose a radical reimagining of AI through the lens of queer theory, a perspective I term 'Multiverse Radical AI.' Whilst simultaneously using critical thinking, I intend to clarify the production of possibilities of an AI curator.

I choose to term the queer sphere inhabited by us as the 'LGBT+ micro-society' rather than a 'community.' 'Micro-society' generally refers to a small-scale social group that functions as a miniature representation or subset of a larger society — a smaller social unit with unique characteristics, norms, and dynamics. The academic term 'community' cannot encapsulate the queer sphere since we do not share its characteristic anthropological, psychological, political or ecological attributes. Ethics cannot be more radically different from one person to another in the queer micro-society.

Within queer micro-society, fear is a prominent force, shaping attitudes and behaviors. Fear of the unknown, fear of the 'other,' and fear perpetuated by societal institutions such as the church and governments contribute to the marginalization and stigmatization of these individuals. This fear also extends into the realm of AI, where the unknown capabilities and implications of intelligent systems can evoke anxiety and resistance. Our societies are built out of the fear from gays, from feminists, from law, from authorities elected by us; in the end everything is reduced to fear. Fear of not being exposed, exhibited or asked for a conference.

Queer identity and AI share, at the very least, a common thread: they both evoke fear of the unknown, of something novel. It is worth noting that Alan Turing, a gay British man, created what forms the basis of computing and AI today. In our contemporary era, Sam Altman, who developed generative AI and deep learning, is also a gay man. In an intriguing turn of events, many areas of human progress exist because of queer individuals. Yet, paradoxically, they continue to face arrest, ostracism, and marginalisation.

Transcending disciplinary boundaries, Multiverse Radical AI engages a diverse array of conceptual tools, critical approaches, and challenges theoretical traditions. It acknowledges the inherently queer nature of AI, as exemplified by pioneers like Alan Turing, whose groundbreaking contributions to computing laid the foundation for modern artificial intelligence, and Sam Altman, who actualised what Turing had envisioned. By drawing upon these varied intellectual traditions, we can cultivate innovative projects that envision a multiverse of possibilities.

In this whirlwind of change, we can draw parallels between the acceptance of the queer community, immigrants, and AI. Just as we learned to accept and celebrate the diversity of queer identities and the richness that immigrants bring to our society, we can also learn to embrace AI as a tool to enrich our lives, to unlock possibilities we never dreamed of. By breaking the barriers of fear and misconception, we can open ourselves up to a future that is as vibrant and diverse as the world we live in.

AI is often considered biased. However, it is arguably much less biased than people who are part of society, as well as those who are not part of the micro-society — essentially, everyone. Therefore, we must first educate people, then AI. Alternatively, we could begin with AI, hoping it will educate humans. This is a radical thought, one that frightens many. It is as unsettling to some as the existence of different universes.

I could conclude my essay here and now. My suggestion is valid and proven: better education leads to a better society and better governance.

Let us briefly recall the installation *Gay Bomb* from 2016 by Zach Blas. The groundbreaking conceptual artworks are known collectively as 'Queer Technologies.' Blas said: "If war is technological, perpetual, and networked, queer networks can provide interstices — places of difference that unite queer activists, intellectuals, and artists in technological agency. The gay bomb detonates a regulatory standard for homosexuality. Gay Bomb is a strategy that blows up this standard with the hope of re-wiring a non-standard of queerness. Gay Bombs explode into interstices of infinite mutation."[8]

Queer AI is not just about incorporating queer identities into AI development; it is about reimagining Free Radical AI from a queer perspective. This involves questioning the heteronormative assumptions often embedded in AI systems and advocating for a more inclusive, diverse AI that respects and represents all identities. The queer con-

cept in academia challenges traditional understandings of gender and sexual orientation, promoting a more fluid and inclusive approach to identity and expression.

This transgressive current disrupts the normative flow of AI development, challenging heteronormative biases and pushing the boundaries of what AI can be. The research for this paper that I called Multiverse Radical AI weaves together queer theory, critical race studies, and radical philosophies to reimagine AI as a tool for liberation, not oppression.

The current AI landscape is fraught with biases that reflect the prejudices of its creators. These biases manifest in various ways, from facial recognition software that struggles to accurately identify non-white faces to algorithmic hiring practices that perpetuate gender and racial inequalities. We seek to disrupt this status quo by drawing inspiration from queer theory. Queer theory challenges rigid categories and normative assumptions, especially regarding gender and sexuality. By applying this lens to AI, we can question the very notion of 'artificial intelligence.' Can AI have a gender? Can it be programmed to be straight or gay? Or should we move beyond such binary classifications altogether?

By way of an example, let us delve into the undiscovered realm where queer journalism intersects with artificial intelligence. Imagine a world where journalism, devoid of any biases, is facilitated by AI. An exhilarating prospect, is it not? We're standing on the cusp of an AI revolution, that, like an unseen tidal wave, will wash over the landscape of competitiveness and innovation. And journalists can work in a more depressurised environment.

The dance between Queer AI journalism, as an example, and the unknown is much like a duet with a shifting rhythm. It is a dance we're all learning, one step at a time. The moves might seem alien at first, the music uncharted, but as we grow accustomed to the rhythm, this strange dance morphs into an art form, a form that captivates and enchants. The fear of the unknown recedes, replaced by curiosity and enthusiasm. Our society is ready to learn this new dance, one that will take us twirling into a future resonant with possibility.

Amidst this post-truth era, there are still agoras such as GAY45.eu — of which I am the proud founder — that provide space for critical awareness of social-cultural problems, truth formulation and expression, and the rethinking of the future anew. It is heartening to know that GAY45, with its core values of doing right and purposeful journalistic articles for the queer community, has been preserved by individuals who were not even born when the first issue went into the old, lead-smelling printing house. Over the last 30 years, the society has witnessed the most profound transformation in human history, from the simple disc phone in the office to the first queer media outlet to use artificial intelligence, alongside the introduction of the iPhone, iPad, WI-FI and many more to the public.

As the playwright Webster foresees in *The Duchess of Malfi*, we are living in a miserable age, where the reward of doing well is merely the doing of it. Yet, queer micro-societies offer a unique platform for testing new academic concepts and education, leading to the most interesting and elastic mentality and openness to novelty. This is precisely why we have so many adversaries and politicians who seek to silence us.

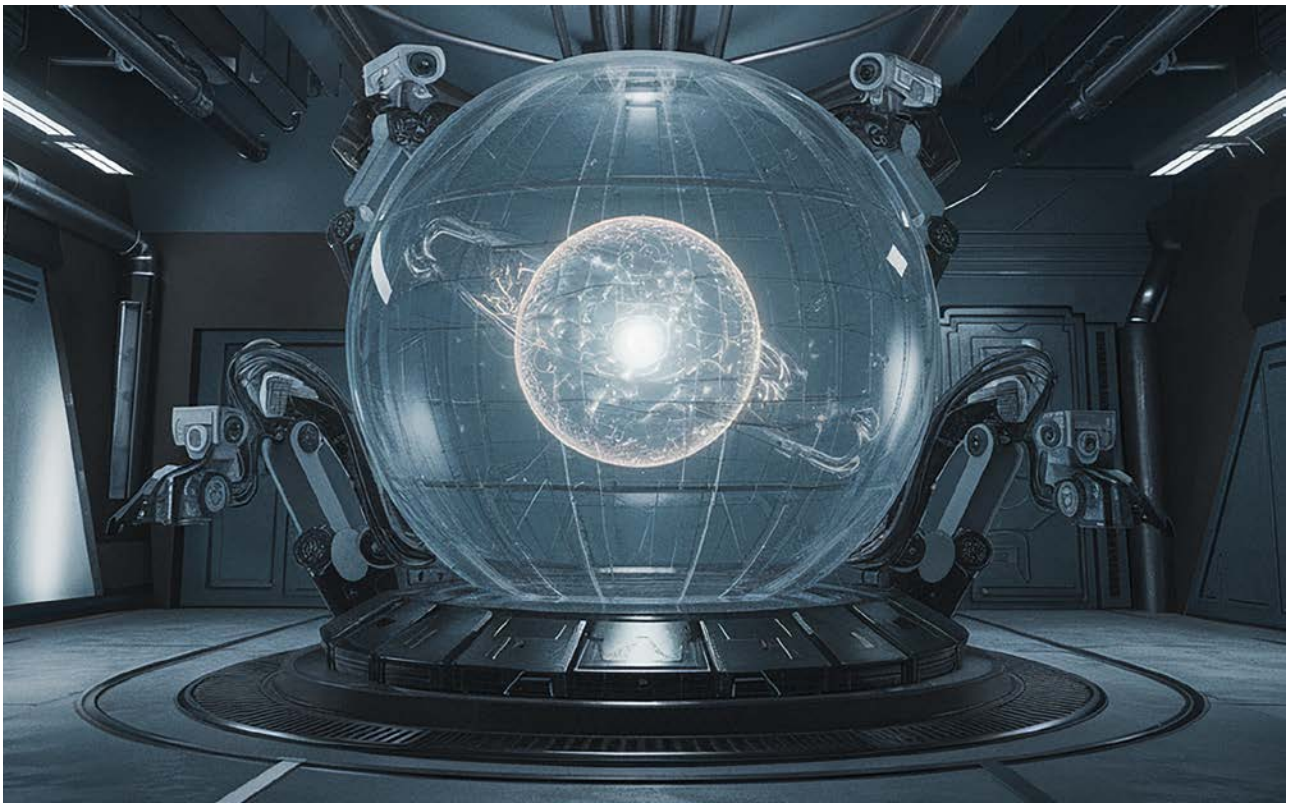
Publications are critical in the current era, where the morality of the citizen and the collective security of the society are at stake. They represent a space where critical thinking, truth formulation, and the rethinking of the future can still take place, away from the calculating powers of the global scene. In such a world, where neo-liberal/ entrepreneurial thinking and contemporary moment focus prevail, it is imperative that such agoras continue to thrive and foster the critical awareness and morality needed for a better tomorrow.

AI should go beyond questioning. It actively seeks to create tools for liberation. Critical race studies inform its approach, ensuring that AI development is inclusive and tackles issues of race and power. Radical philosophies fuel its engine, pushing for a future where AI is used to dismantle unjust systems and empower marginalised communities.

Similarly, the world of AI is not a dystopian landscape, it is a canvas waiting for us to paint our dreams. It is not about replacing human effort but augmenting human capabilities, striving towards a level of efficiency and perfection unattainable by humans alone. It is about the beautiful symphony that can be created when human creativity and AI's capabilities collaborate.

Multiverse /Free Radical/ AI as a new theoretical approach is an academic presumption, it is a rebellion brewing within the machine. It is a call to action for a more equitable and just future of AI, one that celebrates difference and fosters a world where intelligence is not limited by definition.

I believe that the refusal to see the dilemma of 'universality versus difference' that has long underpinned feminist and queer debates as the only political way to think and act



AI JARVIS, first AI curator, generated an image based on the prompt 'Imagine yourself in a free world', 2024. Courtesy of DerAffe.ai.

opens up the notion of the political to redefinitions: not an attempt to change the rules of the game (of language and signification), but an attempt to challenge the game itself, by abstracting thinking and narrowing down the focus to the micro, the molecular, the singular, the imperceptible.

Identity involves a narrowing down of the internal complexities of a subject for the sake of social convention. Ultimately, we guide more diverse and radical discussions of life with digital technologies. Moving beyond the examination of empirical examples and technical solutions, our new imagined sphere called Multiverse approaches the relationship between queerness and AI from a theoretical perspective that posits queer theory as central to understanding AI differently. It poses questions about the politics and ethics of machine embodiments and data imaginaries on the one hand, and about technical possibilities for a production of social identities characterised by shifting diversity and multiplicity on the other, as they are mediated by and through digital technologies.

Transgressing disciplinary boundaries to engage a diversity of conceptual tools, critical approaches, and theoretical traditions, we can create projects where we know there is a multiverse as well as a queerverse. We can envision multiple opportunities for simulations like the ones described. Opportunities were never imagined until we developed AI.

We need to critically question what 'inclusive AI' means. In the context of generative AI, inclusion is often conceptualized as the generation of content that is not stereotypical or offensive and that reflects the significant diversity of the queer community, women's rights and racial origins. Is that even possible? We might hope, but AI is human, right?

However, we must also be cautious when conceptualizing 'inclusive AI.' Inclusion should not merely entail the generation of non-stereotypical content, but rather reflect the significant diversity within the marginalised communities. Achieving this nuanced understanding requires recognizing that while AI is a product of human ingenuity, it should not perpetuate the biases inherent in its creators.

When we acknowledge that a revolution is not a form of resistance, but rather a catalyst in the social process, then innocent victims will no longer be necessary, and neither will collateral damage be inevitable. As the hegemony assimilates all our means of expression, we could identify in its structure the possibility to relocate the multi-culturalism of governmental politics into civic communication, diverging from the false globalisation focused on market economy and the generation of the virtual policentralised capital into a globalization of critical communication beneficial to all micro-societies.

The implications of AI are unfathomable indeed and, up to a certain extent, a Multiverse can be safeguarded in terms of other values, such as its utility, its sovereignty, its aesthetic, and its message. However, when our existence itself conflicts with such values, some of the most shattering questions emerge.

Queer theory, with its emphasis on challenging normative assumptions and embracing fluidity in identity, provides a valuable framework for rethinking AI. Traditionally, AI development has often adhered to rigid categories and binary classifications, mirroring societal conventions around gender and sexuality. Multiverse /Free Radical/ AI disrupts this normative flow, drawing inspiration from queer and black movement(s) theory to question the very foundations of AI.

The current logic of an efficient, result-driven culture and its neo-liberal focus on free market mechanisms supports a flat worldview that, as philosopher Byung-Chul Han describes in *Fatigue Society*, continuously demands transparency and visibility and, therefore, indisputable forms of exhibition.[9] Thus, a horizontalistic world has been produced that, with its twitter-democracy and ubiquitous blogosphere, brings a 'net culture' into being that leaves no room for rest, contemplation, creation and experimentation. Such a world is carried away entirely by neo-liberal thinking and a focus on the contemporary moment where adaptability and flexibility are defined as the highest values, leading to a world that has little regard for the morality of the citizen or the collective security of the society.

Our goal is to ensure that everyone, regardless of income or status, can access accurate information that empowers them. AI could pull marginalised people into the mainstream economy in future years, and thus be a tool for social levelling. If the balance of power will change the control protocols, a shift in AI will break down barriers for people who have nothing, in a near-unprecedented way.

Our intelligence is variously embodied and distributed. It will become even more so as AI systems proliferate, making it increasingly hard to pretend that our achievements are individual or even solely human. Perhaps we should adopt a broader definition of 'human,' to include this entire bio-technological package.

AI models can embody considerable intelligence, just as human brains can, but they are not fellow primates vying for status. As a product of high human technology, they depend on people, wheat, cows, and human culture in general to an even greater extent than Homo sapiens do. They are not conniving to eat our food or steal our romantic partners. They depend on us; we may come to depend on them just as deeply. Yet concern about dominance hierarchy has overshadowed the development of AI from the start.

AI deniers believe that computers are incapable by definition of any agency, but are instead mere tools humans use to dominate each other. Both perspectives are rooted in zero-sum, us-versus-them thinking, as many of my generation think. A generation that wants to stay in power forever and that has no scruple to kick each other for a better position.

AI agents will become commonplace in the coming years, not because the robots are 'taking over', but because a cooperating agent can be truly helpful, both to individual humans and to human society.

If there is any threat to our social order here, it comes not from robots — a term introduced by Karel Çapek in 1920 derived from the Czech word for forced labor, *robota*. It will come from inequalities among human beings. Too many of us have not yet understood that we are interdependent. We're all in it together — human, animal, plant, and machine alike.

In 2020, when my team and I built the first AI curator in history — JARVIS — I was reflecting on the concept of leadership. Theoretically, it does not exist in the context of AI. A leader must generate optimism. But can AI generate optimism? No one wants to get on a plane with a depressed idiot pilot. You want the person in charge to look like they have something to live for. You try to exude confidence, not anxiety.[10]

The implications of art are unfathomable indeed and some of the most shattering questions will emerge. What do we need today? A basic-state? A state-of-equalities? A post-state? How does the role and methodology of art intercede? Could art be a tool for struggle, progress, and debate? Could Artificial General Intelligence (AGI) help progress and answer these questions? It will probably be more complicated than we think if leadership in the art world remains the same as it was 30 years ago.

This text is an extract from Răzvan Ion's book The Multiverse of Critical Thinking Radical AI *(to be published in 2026).*

Notes

1 Will Gompertz, *Think Like An Artist. … and Lead a More Creative, Productive Life* (London: Penguin, 2015).
2 Sarah Thornton, *Seven Days in the Art World* (New York: W.W. Norton, 2008).
3 Maeve McCleneghan, "Damien Hirst shark that sold for about $8m is fourth 2017 work dated to 1990s", *The Guardian*, 22 March 2024, accessed February 4, 2024, https://www.theguardian.com/artanddesign/2024/mar/22/damien-hirst-shark-that-sold-for-about-8m-is-fourth-2017-work-dated-to-1990s
4 Razvan Ion, "The Horrible Art World's Cult of Silence That Protected Claude Lévêque", *Gay45. Journal for queer freedom & creativity*, 22 April 2025, accessed February 4, 2024, https://gay45.eu/the-horrible-art-worlds-cult-of-silence-that-protected-claude-leveque/
5 See Yuval Noah Harari, *Nexus: A Brief History of Information Networks from the Stone Age to AI* (New York: Penguin, 2024).
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Dr Răzvan Ion is a university professor of critical thinking, intersectional innovator, academic curator and tech queer activist. He lectured globally about AI, queer journalism theory, critical thinking and curatorial studies. He is best known for leading the DerAffe Vienna team in creating A.I. JARVIS, the first artificial intelligence curator in history and founding GAY45.eu, an award-winning European queer indie journal and queer journalism school. Dr Ion is the founder of Pavilion Art Center, Pavilion Journal, Bucharest Biennale (with Dr. Eugen Rădescu). He has held positions as an associate professor and lecturer at several institutions, including the University of California, Berkeley; University of Bonn; Hochschule für Musik und Theater München; University of Vienna; Lisbon University; Central University of New York; University of London; Sofia University; University of Kyiv; University of Bucharest, where he taught Curatorial Studies and Critical Thinking. He has held conferences and lectures at various art institutions such as Witte de With in Rotterdam; Kunsthalle

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Based on the world-theoretical model of the paraverse, the issue explores which parallel worlds of curating, exhibiting and collecting art have emerged in digital spaces, and how these can be situated in relation to the familiar physical-analogue world of exhibiting and collecting art — whether as an extension of existing institutional practices or a parallel-world phenomenon of a subversive, institution-critical digital culture.

How does the practice of curating art — pre-digital, algorithmically generated and minted art — change through its migration into virtual spaces, cross-realities and automated scenographies, and what is the impact of generative AI imaging on it? What new display, participation and mediation possibilities do digital and net-based exhibition formats offer? How are public and private collection strategies and practices changing through the introduction of NFTs and blockchain technology?

The Paraverse issue brings together diverse theoretical, practical and empirical perspectives from researchers, curators, and artists. Under discussion are the digital image politics of curating, showing and mediating art and cultural heritage, the blockchain-induced decentralization and commoning of exhibition-making, collecting, and art sales. In addition, the issue addresses the potentials and risks of artistic value creation and value preservation in the collective space of virtuality, and the future of art-curating in the age of artificial intelligence.

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Manuel Rossner, *Spatial Painting (Tokyo Opera Tower)*,
2021, InterCommunication Center Tokyo.