A Peer-Reviewed Journal About

EVERYTHING IS A MATTER OF DISTANCE

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Editorial: Everything Is A Matter Of Distance

Magdalena Tyżlik-Carver
& Pablo Velasco

In physics, distance is measured as the product of speed and time; in mathematics, it is defined as the total path travelled by an object from one point to another. Both definitions share an operational clarity but capture only a single dimension of the relationship between objects. The lived reality of distance—and its counterpart, proximity—resists such simplifications. As the Uruguayan poet Cristina Peri Rossi once wrote, “in love as in boxing, everything is a matter of distance”,[1] invoking a layered and ambiguous interplay in which closeness and separation constantly reconfigure one another while also engendering feelings that defy to be framed into a formula, or so we think.

One recurring question in the contributions that follow is how space itself is produced, shaped, and manipulated in contemporary techno-culture. Proximity today is engineered through techniques of approximation—statistical modes of patterning identities, collectivities, and affective bonds to corporate infrastructures. Critical vocabularies have long privileged *distance*—critical distance, aesthetic distance—but we are already immersed in these approximations as we are addressed, enrolled, and captured through platforms and other interfaces of affective persuasion. The challenge, then, is to ask: how might critical digital culture research manoeuvre in this terrain—from platforms to infrastructures, from interface to aesthetics, from love to boxing?

The articles in this issue shift across different media - from sound to software, visual cultures to performance. The authors explore how bodies move and are moved, how images, and sounds are extracted, and transcribed in algorithmic technologies, and what is not captured in the dynamics of near-distant-remote modes of sensing and modeling. All this implies different scales and recalibrations where proximity is not necessarily "near" in the traditional sense (but it can be); remoteness is not necessarily only "far." The algorithmic politics of distance must also contend with the *logistics of approximation*, i.e. the statistical basis that is evident for example in machine learning technologies, including their potential modes of violence. A violence that is both geo-political, takes place in systemic exclusions of people, and generative forces activated by near or far relations that pull in human, nonhuman

and more-than-human bodies into datasets, representing them as numbers that can be pulled and pushed into exponentially evolving input and output relations.

The publication offers various interpretations of such relations, and it builds on the research workshop organised by DARC/Digital Aesthetics Research Center (Aarhus University) in collaboration with transmediale festival for art and digital culture, Berlin, in 2025. It expands on workshop's 'proceedings', a process started in the run to the transmediale festival when participants, prior to meeting IRL, circulated and commented on essays of 1,000 words. Essays have been published, edited and commented on a shared wiki (using Media Wiki software), discussed (and reduced) at a workshop, published and distributed at the festival[2] using web-to-print techniques that build on the JavaScript library Paged.js[3] and the works of an extended community network.

We use the word 'proceedings' as a verb and an action as we continue to interrogate how proximity and distance unfold in the production of academic writing, for instance the idea of peer review, or the conventions of formats and formatting, or the use of particular software for text processing or print. To proceed with is a continuous action that unfolds in multiple ways and over time, with multiple methods, across a shared space of inquiry which sometimes is the networked server, or the rooms in Silent Green where participants and contributors to this issue gathered. To proceed with research is to continuously redefine relations and distances; stretching, spacing, pulling things, concepts and bodies into and out of relations that can be processed or (mis)understood, or explained, or followed, scaled, or reduced, fit into tables or expanded into cities and streets. In these movements relations are re-composed and experienced in different ways proposing new interpretations and constellations of reading and moving bodies.

Such recalibrations are necessary to account for how different bodies are pulled into relations by different forces--forces that shift with the changing coordinates of time and space. This dynamic is apparent in the contribution by Megan Phipps who explores the digital and technologically mediated condition of over-exposure to signal and image, and its impact on our sensorium. Drawing on the experimental work of VJ Peter Rubin and the architecture of Berlin techno events in the late 1980s and early 1990s, Phipps investigates techno-aesthetics generated by Rubin's "sensory architecture" - a fusion of visuals, movement, and rhythm crafted for such events as Mayday and Chromapark. In these spaces, bodies are not simply immersed in sound and light but are tangled with the digital, network, political and architectural infrastructures that frame them. Simulation emerges as much from data structures as from embodied feedback loops. Phipps names this the *techno-ontological fold*, a conceptual frame for understanding contemporary digital life where existence is shaped by "the pulse of notifications, the infinite scroll of feeds, the curated tempo of livestreams." The effect of reduction of reality through algorithmic means also takes place sonically. Nico Daleman explores how the technology of "noise reduction", not only separates noise from an acoustic signal, but introduce its own algorithmic noise. Active noise cancelling is embedded in

many sound devices and populates our video mediations (e.g. through zoom or alikes), offering an encapsulated soundscape, or a transductive transparency (through "hearthrough" modes). Daleman argues, however, that this process is not merely a naive phenomena, and introduces two dissimilar modes of perception: the one more commonly perceived, and the second and algorithmically altered one. Processes of filtering, interception, and conversion, generate a disembodied and ideal signal, a violent and alienating disruption disguised as an improved listening experience. This mediated distance takes place also through image manipulation, as Katya Sivers shows in the case of Russian mainstream media. Departing from the case of a political intervention from an employee of state media during a live broadcast, Sivers traces back the historical role of manipulated images and censorship in soviet and post-soviet political regimes. Beyond mere acts of censorship, Sivers argues that "image laundering", or the distortion and manipulation of images through technology, acts as a political fabrication of reality. Acting as an epistemic obfuscation, the practice of alteration of images, modifies the conditions upon which they can be experienced, in particular in the context of warfare imaginaries.

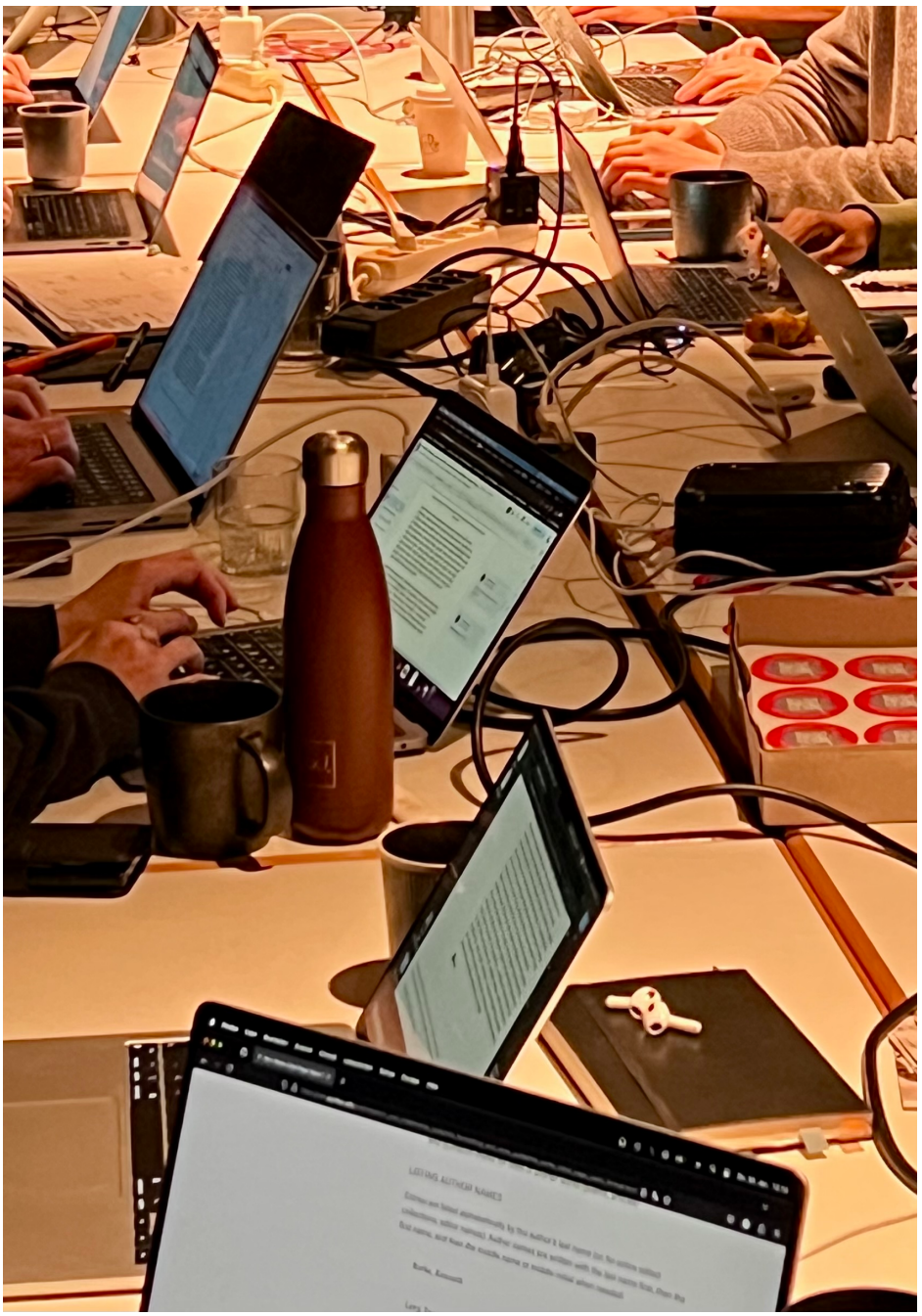
In their critique of algorithms and their effects on queer bodies, Christoffer Koch Andersen examines queer struggle to create distance from algorithmic capture. They trace how queer lives inhabit liminal spaces, zones “between being targeted and dismissed by algorithms,” that resist and refuse the violence encoded in binary logics. These in-between states open possibilities of “keeping with the complex uncodability of transness in opposition to the binary limits of algorithmic technologies.” Koch Andersen turns to aesthetic potential of this uncodability proposing that trans lives can manifest as a glitch, a disruption that both reveals and unsettles the algorithmic order. This glitch becomes a way of co-producing liminal distance making the violence of algorithmic systems visible while asserting modes of existence beyond capture. In doing so, they reposition algorithmic distance not solely as exclusion, but also as a terrain of possibility where not fitting the binary code becomes a generative act. Daria Iuriichuk examines how proximity is created through digital intimacy. Platforms like Onlyfans mediate a type of content that simulates and even commodifies intimacy. This production of proximity is, however, not natively digital, and has an embodied history, which Iuriichuk explores through the lens of choreography. In this sense, choreography is a technology that encodes tradition, social structures, and affect. The abstraction of movement is also data, and as such, the author offers choreography not only as a dance strategy, but also as an analytical tool to explore contemporary digital intimacies. Through a series of short case studies, choreography is dissected and shows both its potential to enable systems of control, and its subversive capacity. Extending these questions of mediation and value into the institutional sphere, Sami P. Itävuori examines the generative possibilities and limitations of AI in museum practice. While AI increasingly shapes how museums operate as collectors of art responsible for sharing art with the public, it also complicates how art is communicated and experienced. Itavouri contrasts the *computational approach to aesthetics* found in computer science, with its emphasis on metrics and

optimisation, with the values of artistic authenticity, creative labour and aesthetic experience. The point of contention is the fact that museums often remain passive adopters of AI-powered software, allowing artworks to circulate as digital images whose value drift from the original context. In this translation from physical to digital a shift in proximity occurs where audiences are brought closer to collections through instant access, yet distanced from sensory, spatial and cultural encounters that give art its depth.

Taken together, these contributions reveal that distance and proximity in digital systems are never fixed states, but constantly shifting relations that are engineered, contested, reimagined across sensory, political and institutional domains. Proximity is not inherently intimate, while distance is not necessarily alienating. In networked culture, they are mutable coordinates constantly influenced by algorithms, interfaces, infrastructures, and cultural practices that shape them. Digital systems continually recalibrate these relations, pulling us into certain configurations while pushing others away, often without our consent. What emerges is a complex cartography of near and far, intimate and remote, invisible and visible, which demand new methods for navigating, resisting, and reconfiguring the spaces in which we find ourselves.

When researching contemporary post-digital culture, the task is to understand the interplay between distance and proximity as a field in which to act. Peri Rossi reminds us about the rhythms of love and boxing and the affects they engender, and the terrain of technoculture might need similarly radical choreography. We must be willing to enter and exit proximity strategically: to step in when intimacy is weaponised and step back when distance breaks systems of capture. This means refusing the default corporate settings of digital infrastructures, unsettling the coordinates of near and far that algorithms stabilise, and inventing counter-geographies that redistribute access, attention, and power. Taking proximity as tactical and distance as insurgent, the challenge is to operate across these with intention of remaking the conditions of relations so that they no longer serve extraction and control but open space for collective autonomy, care and transformation.

We hope the workshop and its proceedings are an example of such intentions of which effects are assembled and maintained through collective effort. This would not have been possible without the active participation of not only those mentioned to this point, the authors of articles but also the wider network of participant-facilitators (which includes Nicolas Malevé, Søren Pold, Jussi Parikka, Maya Erin Masuda, Paul V. Schmidt, Ruben van de Ven, Matīss Groskaufmanis, Kola Heyward-Rotimi, and Maja Funke). In addition, we appreciate the institutional support of SHAPE Digital Citizenship and Digital Aesthetics Research Center at Aarhus University, the Centre for the Study of the Networked Image at London South Bank University, and transmediale festival for art and digital culture, Berlin.



"Everything is a matter of distance" DARC workshop at Silent Green, Berlin, 29-31 January 2025.

Notes

1. ↑ Peri Rossi, Cristina. *Otra vez eros.* Lumen, 1994.
2. ↑ The proceedings publication can be downloaded at: https://ctp.cc.au.dk/semi/read/147/pdf
3. ↑ https://pagedjs.org/

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Folded Distance: Towards A Techno-Ontology Of Distributed Aesthetics

Megan Phipps

Abstract

This article proposes "folded distance" as a critical conceptual framework to theorise techno-ontological aesthetics in the context of networked media and digital culture. In contrast to representational approaches, it introduces the notion of *techno-ontology*—a mode of analysis that foregrounds the operational, recursive, and affective infrastructures of networked life. Through close examination of VJ Peter Rubin's live-mixing practices and the immersive architectures of techno-events, such as Berlin's Mayday and Chromapark, the article elucidates how media systems enact distributed sensation, rhythmic entrainment, and modulated proximity. Folding, in this context, is theorised as both spatial and affective topology through which subjectivity, perception, and relation are reconfigured. The recursive logics of technical media are shown to generate aesthetic conditions where distance is infrastructurally mediated rather than spatially determined. This study contributes to debates in media theory by articulating a techno-aesthetic ontology of sensation—one that interrogates how recursive systems shape the lived realities of digital and post-digital culture.

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Introduction

Moving through the layered proximities and stratified intimacies of contemporary digital aesthetics, this article traces the recursive folds that pulse across rave floors, signal pathways that map media infrastructures, and the ambient architectures of networked life. The concept of *folded distance* is proposed as a technologically generated spatial and biologically affective condition, in which proximity and mediation converge through distributed emergence. Folded distance is a virtual architecture of being-together apart, a modulation of sensation or presence tuned through electromagnetism, circuitry, and loops of light, sound, and code. *Distributed intimacies* is proposed as an additional concept, intended to further this framework, describing how relationality-as-intimacy is now routed through latency, signal, and affective entrainment. These entanglements operate within *techno-ontological affect* —a field where media form(at)s transcend isolated interaction, manifesting in collective phenomena intrinsic to Techno/Tekno raves, networked media ecologies, electronic pictoriality, platforms, CGI, AI, and beyond. Consequently, cultivating decentralised, immersive experiences, that gesture toward a mythos of potential that promises to enable processes of de- and re-territorialization across social, political, cultural, and personal landscapes.

This exploration aligns with the broader evolution of digital culture, where emergent media formats and the affective architectures of mass communication continually reconstruct the collective fabric of experience and perception, which is driven by the flux of technological mediums. *Recursive techno-aesthetics* unfold and reassemble within the signals of these affective architectures as operational milieus —feedback-driven ecologies that are autopoietic in structure, generating and regulating affective climates. They encode coherent vibing intensities as well as their erosion into perceptual saturation and attenuated attunement. Within such architecture, *network anesthesia* (Munster) hovers as an affective condition. Once indebted to the clinical origins of anesthesia in industrial-era surgery, where the numbing of factory-worn bodies paralleled the rise of mechanised perception (Buck-Morss), aesthetic affect undergoes modern reconfiguration. In its digital iteration, this anesthesia no longer silences surgical pain but disperses as overexposure to signal and image that dulls critical response, replacing intensity with ambient haze, disorientation with seamless flow. What arises is a recursive sensorium, layered assemblages of perception and sensation that elude binary framings of the body as either individual or collective, biological or machinic. Folded distance thus offers a conceptual incision into the architectures of mediation, where the body becomes inflected, interfacial, and ambient. In tracing these dynamics through the experimental visual rhythms of VJ Peter Rubin, and the immersive architectures of Techno events like Mayday and Chromapark, this article articulates a conceptual *techno-ontological* terrain governed by *recursive techno-aesthetics*, *folded distance,* and *distributed intimacies*. Inhabiting this recursive field, we are compelled to ask: how might we locate and/or recompose the rhythms of our technological present?

Rhythm & Architecture of Techno-ontology

Techno-events do not unfold in neutral space, they inhabit and reconfigure historically saturated architectures. The power of techno events lies in transforming "techno spaces" into transregional, transnational, and transitional aesthetic sites. In 2024, German UNESCO paradoxically acknowledged this elusive presence by inscribing Berlin's techno culture into the National Inventory of Intangible Cultural Heritage, describing it as "electronic sounds strung together in a rhythmically monotonous structure" (*German Commission for UNESCO*). A formative example is Tekknozid (see Figure 1), a pioneering rave series held in Berlin between 1989 and 1992, widely credited as the first German rave initiative and thus a crucial influence on the evolution of the city's techno/tekno scene. Despite its intangible signifier, techno/tekno culture is inextricable from the subcultural reclamation of collective identity and spatial agency. Events like Teknivals embody this ethos, occupying contested or abandoned sites and turning them into virtual, liminal zones of perceived connection and collective resistance. Ephemeral interventions intended to critique state control over land, culture, and access to public space. Similarly, Germany's Mayday festival, launched in 1991, emerged as a protest against the threatened closure of East Germany's youth radio station DT64.

American-born, Amsterdam-based experimental filmmaker and video artist Peter Rubin played a formative role in shaping the architectural aesthetics in Germany's technoculture, such as in Mayday's. Beyond his organizational support, Rubin crafted the festival's sensory architecture through fusing visuals, movement, and rhythm into a singular techno-aesthetic. His first engagement in Germany came in 1988, when he brought his VJ practice from the Netherlands to Berlin's Tempodrom, followed soon after by a performance at Hamburg's Grosse Freiheit. In 1994, three years after Mayday's debut, Rubin returned to Berlin for Chromapark—the first exhibition devoted entirely to techno art and culture. Held at E-Werk under the theme 'House of Techno', Chromapark reimagined Berlin as a speculative media ecology. From U-Bahn interventions by Lila Lutz, Christoph Husemann, and others, to a continuous 96-hour rave-exhibition featuring over 40 artists, Chromapark collapsed the distinctions between art gallery, discotheque, and media lab. The post-reunification void—social, political, and architectural—offered fertile ground for reappropriation. Vacant East German factories, bunkers, and power stations became vessels for social and sonic inhabitation. Venues like E-Werk, Tresor, and Berghain (formerly Ostgut) emerged not merely as nightlife spaces, but as affective techno-architectures where historical detritus fused with a hope in ecstatic cyber futurity.

Figure 1: Tekknozoid Flyer from the year 1991. The Peter Rubin Collection: Amsterdam. Courtesy of Eye Filmmuseum.

Berlin's techno-aesthetic politics drew power from the city's raw materiality—concrete, steel, rust—and infused it with loops of light and sound. Chromapark's E-Werk, a site housed in a former electricity plant in Mitte and active in the early 1990s, straddled a moment of techno-ontological transition in Berlin's techno imaginary. Its architecture was marked by clean industrial lines, open multi-level layouts, and cathedral-like vertical volumes. It honed a spatial grammar that activated both the machinic past of energy production and the spiritually speculative future of digital collectivity. Unlike the total occlusion of subterranean compression in Tresor, or the sensorial vortex of verticality in Berghain, E-Werk cultivated a "modulated openness" as a surface of spatial recursion across levels, balconies, and stairwells. As dancers moved vertically and horizontally through its

grid, they were caught in *rhythmic feedback loops*—not just of music, but of collective movement, expanded architecture, as well as virtual and visceral affect. As Brian Massumi notes, "a building is a technology of movement... in direct membranic connection with virtual event spaces" (204). Following Massumi, techno-architectures and techno-events thus engender virtual techno-aesthetic matrices: environments that produce and are produced by the movement of recursive flows of affect, rhythm, and embodied presence. Like the dancing attendee, the crowd itself becomes a techno-social body that is tuned to pulses, flickers, and spatial thresholds.

In the context of techno-ontology, the virtual folded architecture of the networked rave is a rhizomatic cartography that re-maps intimacy and distance. It is a dance of spatial and rhythmic dynamics oscillating between proximity and separation, individuality and collectivity, orientation and disorientation. The techno/tekno rave's foggy dancefloor, saturated with recursive images, beats, and stroboscopic flickers, embodies *rhythmic space* (Lefebvre): a space not statically given but produced through the interplay of bodily, social, and environmental rhythms, and as lived, affective zones continually reconfigured through repetition, difference, and syncopation. Within these environments, sensorial distance is not erased but folded as it is stretched and reframed through industrial-mechanical recursive cycles of decentralised sound, light, and (collective) movement. Recursive oscillations become both structuring force and site of disjunction, a deterritorialised zone of molecular motion, composing a techno-affective matrix where identity, agency, and perception are rendered and recalibrated. *Folded distance* becomes the operative condition of the techno-affective matrix, emerging as distributed presence that is modulated across signal paths and recursive perceptual architectures, resisting binary models of the body (e.g., individual or collective, organic or machinic). In this techno-aesthetic milieu, rhythmic folded distance is both perceptual and architectural: a topology where the expanded screens and techno tones becomes a sensory membrane, and the network becomes an ambient field of a new anaesthetic affect (Munster). Presence is no longer singular, immediate, or bound to the intensity of individual consciousness, but rather becomes recursive, patterned, and machinically modulated across environments and biological systems, expanding any pre-conceived notions on the boundaries of mediated proximity.

In the techno-event or rave, distance becomes felt in the shared pulse of bodies and mediated through the technological interfaces of sound systems, visual projections, and expanded visuals (Reynolds; St. John; Butler; Garcia; Thornton; Gaillot; Holl). This interplay enacts feedback that is recursive, where proximity becomes reconstituted through rhythmic entrainment and distance is reimagined as resonant intervals within the latency between beats, flickers, gestures, and re-mixed visual media. Within the techno-aesthetic paradigm of the mediated sense acts (Fedorova), this perspective highlights a critical ontological tension requiring a rethinking of the Real and aesthetics in media theory (Fazi). Particularly, it addresses the conceptualization of images as they reconcile the fluid, continuous

nature of sensory experience with the discrete, fragmented digital "bits" traversing hyper-networked virtual architectures. In the context of new media assemblages and the advent of discorrelated images (Denson), the blurred flatline between real/virtual, simulated/physical, and synthetic/non-synthetic images emerges as a liminal zone that requires historical and theoretical tracing. Namely, what modes of *techno-aesthetic operations* govern the movement constituting the hyper-networked audiovisual images, dispersed across aggregates in flux? What machinic logics, what rhythmic recursions, drive the movement of hyper-networked images? How do they circulate, fragment, and recombine across architectures of flux? And, what exactly are techno-aesthetics in relation to operationality versus experimentation, and as constituting folded distance(s)?

Before addressing questions concerning techno-aesthetics as operational systems or experimental ruptures, recursion must be situated as the coupling of automation and emergence. Yuk Hui frames recursion as a spiral of individuation, where each loop expresses singularity and self-determination (Hui). Within this framing, a critical distinction arises between *technological implementation* and *artistic experimentation*. Though both operate within techno-aesthetic domains, their trajectories diverge both functionally and ontologically. Artistic practices, such as Rubin's live-mix visuals or rave's rhythmic architecture, generate perceptual uncertainty that craft affective spaces intended for the unsettling of normative embodiment. Technological implementations, by contrast, operationalise, automate, and codify these affective dimensions into predictable loops of capture, habituation, and optimization. Thus, if experimentation opens zones of affective potential, implementation folds them into circuits of profiling, feedback optimization, and predictive modulation. The tension between disorientation and modulation, rupture and recursion, marks the contested terrain of folded distance. Recursion becomes no longer a generative fold but a flattened logic of modulation and control. Folded distance becomes the battleground between technics as protocol and technics as potential.

Techno-Aesthetic Operations of The Fold

Techno-aesthetics mark the threshold where technical apparatuses acquire aesthetic force through human gesture, movement, and perception (Simondon, "On the Mode of Existence of Technical Objects "). Techno-aesthetic operations form a milieu in which subject and system no longer stand opposed, but co-emerge through loops of feedback, ambient intensities, and machinic attunement (Simondon, "On the Mode of Existence of Technical Objects"; Deleuze and Guattari). In this configuration, "techno" functions as a conceptual-aesthetic vector, an abstract interface with the machinic, where perception and system become reciprocally generative (Rapp) enacting mediation of (relational) perception and biofeedback. This orientation invites a turn toward aesthetic coherence as it arises within distributed systems, not through semantic unity but through emergent aesthetic consistency. Drawing from machine learning and continental aesthetics, Peli Grietzer proposes aesthetic unity—or *vibe*—as an

"abstractum," a shared vector of affective coherence across divergent inputs—"the collective affinity of the objects in a class" (27). To approach techno-aesthetics, one must then also consider the role of the abstract collective—the weaved assemblage, and the fold between the layers in the assembled set—as that which constitutes an abstraction paradoxically inherent to the representational logic of human subjectivity. To deepen an understanding of distributed aesthetic unity, Gilles Deleuze's concept of the Fold, developed in *The Fold: Leibniz and the Baroque* (1993), offers a critical method here.

For Deleuze, the Fold is a continuous operation and an ontological gesture that replaces the dichotomy of interior and exterior with a topology of relational contingency. Drawing on Leibniz's monadology, Deleuze envisions folds as infinite, compressed, and enfolded within matter itself. The Fold is thus an abstract architecture of subjectivity shaped through inflection, bending, and co-formation. In a 1986 seminar entitled *Subjectification*, Deleuze declares: "Folding the outside… placing oneself on the inside of the outside… not at all a personal sort of interiority" (Deleuze; "Foucault Seminar: Part III – Subjectification"). This is the crux of the Fold: it functions as a diagram of subjectivation and a logic of becoming in which the inside is not a given interiority but a position on the "inside of the outside," formed through recursive engagement with external forces (Deleuze, "Foucault" 103). Subjectivity, in this sense, is not a sealed or closed entity (Deleuze *Cinema 1* 60; *Cinema 2* 98), but a transductive process, a topological inflection shaped by the interplay of forces, systems, and sensations (Simondon, "On the Mode of Existence of Technical Objects"; Deleuze, "The Fold*";* Massumi). Erin Manning extends this by conceptualizing the Fold as a site of 'movement-thinking'—a pre-cognitive field where sensation exceeds representation and subjectivity is felt before it is named (Manning). In her terms, the Fold is where affect becomes operative: a generative milieu in which perception, relation, and motion co-compose. Applied to techno-aesthetics, the Fold thus emerges as a structural figure for understanding abstraction as affective proximity—as a sensuous logic across virtual and actual domains. Grietzer's "vibe" resonates as a maximally virtual *Stimmung* (mood) that binds disparate elements into affective coherence. It is within this field of recursive abstraction and modulation that techno-ontological operations unfold.

VJ Peter Rubin's live-mixing practice offer a tactile instantiation of the Fold as techno-aesthetic praxis. Through recursive layers of moving images, flickering projections, and audiovisual loops, Rubin's performances function as techno-aesthetic sites of both abstraction and subjectivity. His *Mayday Vision Mix 1* (see Figure 2) elucidates this dynamic as a saturated palimpsest of re-mixed samples, sensory textures, temporalities and visual intensities. Rubin's VJ process began with a collection of curated material—TV broadcasts, avant-garde cinema, early computer-generated imagery via the Panasonic MX50, and live footage of ravers—all woven into a real-time choreography of signal and affect. Each source—fixed on VHS tape—formed a discrete "set," as contained visual archives. Yet in performance, these closed sets became operationally open. Rubin loaded dual VHS

decks, switching inputs live to create emergent pairings, modulating rhythm and visual tone in response to crowd energy, musical tempo, and spatial dynamics. The set's affective potential thus exceeded its material fixity. Rubin's artistry of discovering aesthetic unity lay not only between media sources, movement in two oscillating images, but also in attuning to the virtual atmospheric and intangible aesthetic inherent in the ambience, pulse, or *vibe* of the room, setting, and crowd. Through layered rhythms of moving images, flickering projections, and immersive audiovisual loops, Rubin's work became both a site of artistic experimentation and evidence to techno-aesthetic operations of collective abstraction.

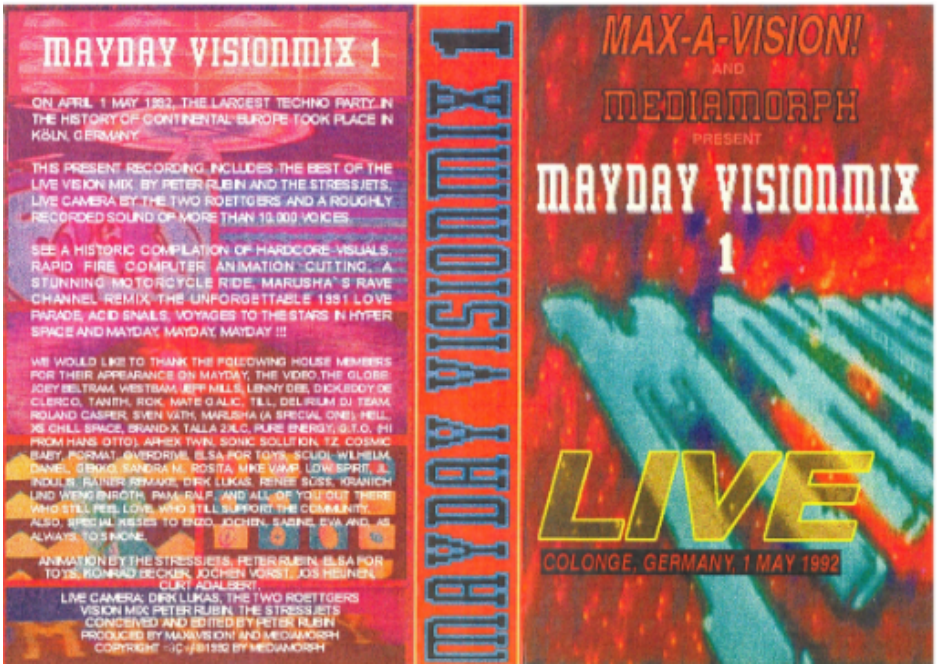

Figure 2: Peter Rubin. VHS cassette, box cover. Mayday Visionmix 1. 1992. The Peter Rubin Collection: Amsterdam. Courtesy of Eye Filmmuseum.

The techno-aesthetics of *Mayday Vision Mix*—split-screen panels, increased source-input options, and hyper-rapid rhythmic alternation or convergent cuts (Deleuze, *Cinema 1* 56; *Cinema 2* 43)— illustrate the operations of aesthetic unity by enacting the techno-ontological Fold in two key ways. First, they emerge from time-coded media infrastructures, shaped by earlier circuits of broadcast and signal transmission. As Friedrich Kittler reminds us, what we can see or hear is always conditioned by what media can store, process, and transmit (Kittler). Rubin's work channels this media archaeology, elucidating how audiovisual formats are haunted by prior regimes of perception, recursively feeding forward in layered remix that demands a sense of agency. Second, Rubin's aesthetics anticipate the oversaturated visual logic of contemporary networked media ecologies. His techniques prefigure today's expanded sensor-media environments constituted by affectively dense visual flows that float in recursive loops—palettes and rhythms unmoored from linear narrative or spatial logic. The Fold, here, becomes an emblem of the audiovisual excesses of contemporary techno-images—images that no longer depict binary subjectivity, but pulse in the folded liminal zones of institutional media regimes and individual affective perception.

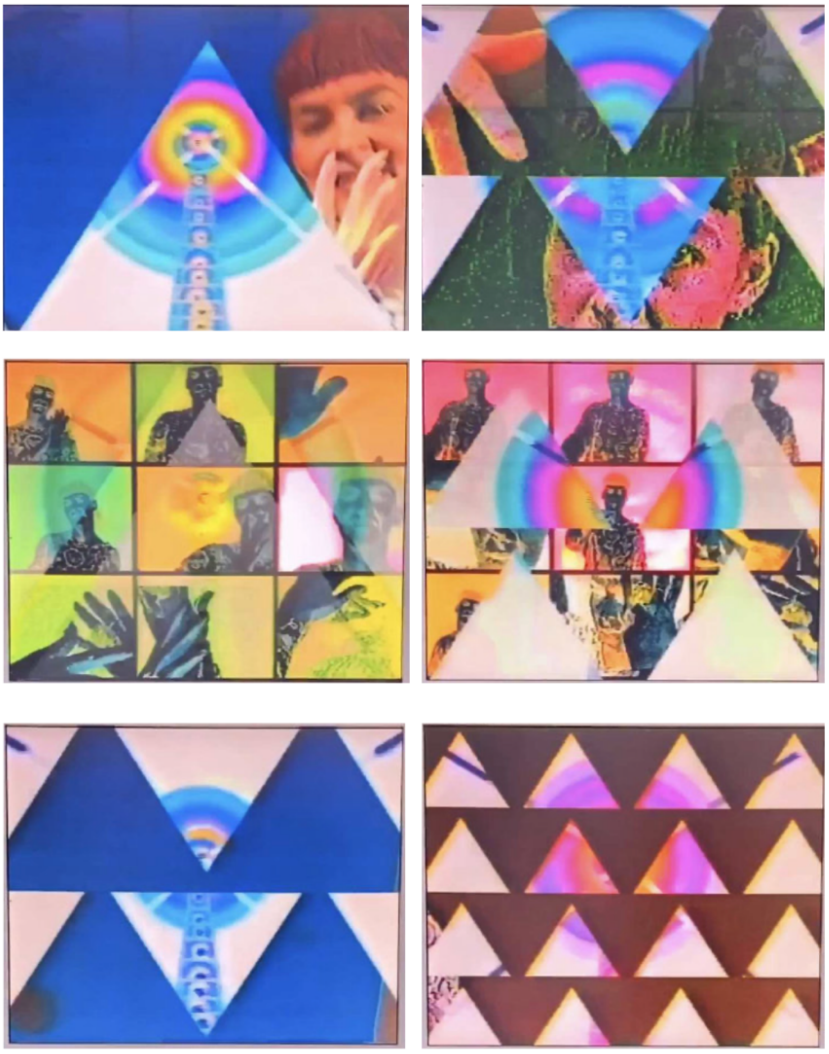

Figure 25. Peter Rubin (MAYDAY VISION) *Mayday Vision Mix 1* Screenshots. © EYE Filmmuseum.

Figure 3: Peter Rubin. Mayday Visionmix 1. 1992. (curated selection of stills). The Peter Rubin Collection: Amsterdam. Courtesy of Eye Filmmuseum.

Contemporary techno-images can be defined by their hypermodulated plasticity, oversaturated palettes, upload excess, and decoupled spatial logics and topologies. They float in a liquid visual field of ephemeral loops and recursive rhythms, as 'groundless' (Gil-Fournier and Parikka) configurations that reflect a profound ontological shift in the form and function of the audiovisual image. No longer tethered to a singular frame, these visuals dissolve traditional cinematic dispositifs (Baudry; Foucault " Power/Knowledge"; Stiegler; Elsaesser). Instead, becoming mutable nodes in a larger structural system of data flows and affective registers. Namely, contemporary techno-aesthetics now operate within vast, slippery, and sticky (Rushkoff; Munster 100) assemblages layered with rendered ambiguity and buffered abstraction. In digital or computational aesthetics, AI systems process imagery through depth maps, shadow buffers, and probabilistic textures that reconfigure perception across machinic and human registers. These operations mark the shift from local, embodied sensation to planetary-scale modulation: from

representation to recursive sensation. The techno-aesthetic image becomes a node within a distributed infrastructure that hovers between abstraction and immersion, data and flesh, system and subject. Through the lens of techno-ontology, such images are not simply seen but felt, folded into the environments they circulate within. Rubin's artistic works, and transition from cinema as experimental filmmaker to techno artist as VJ, anticipates a broader shift toward the logics of techno-aesthetics: hypermodulated, synthetic visuals traversing a "sea of data" (Steyerl), a corpuscular, media-ecological fog (Massumi, 146; Gibson) of disarray and affect of networked bombardment. Rubin's legacy, then, lies not just in pioneering a live-media performance style, but in foreshadowing a broader ontological condition: where sensation is recursively bombarded, imagery is algorithmic and programmed, and affect becomes distributed, remixed, and infrastructural.

Affective Registers of Folded Distance: Network Disorientation & Distributed Intimacy

Rubin's remix craft—rooted in sampling, splicing, découpage, and modulation—prefigures the fluid, recursive visual logic that now defines the hyperlinked weave of techno-aesthetics in networked environments. However, Rubin's early influence draws from abstract, avant-garde, experimental, and structural film traditions, particularly flicker films and kinetic time-based art—as exemplified by Paul Sharits, Peter Kubelka, Eric De Kuyper, etc.—or "the art movement of the 1960s known as 'op art' or 'kinetic art' ('art cinétique')" (Lameris 86). As Bregt Lameris notes, artists like de Kuyper explored rhythm through 'oscillations and instabilities' (86), treating these elements as the grammar of sensation. In *La beauté du diable*, de Kuyper reflects on the rhythmic role of color alternations, suggesting that editing can serve as synesthetic layering akin to musical counterpoint that has clear effect on the spectator (21). These early explorations of flicker, rhythm, and sensory overload laid the groundwork for techno-aesthetic operations and the affective registers of rhythmic spaces and techniques that would later unfold across clubs, screens, and data centres.

From analog light shows to stroboscopic assaults, operations of techno-aesthetics have probed perceptual thresholds of vision by inviting us to see what has no physical anchor. These perceptual strategies trace back to mid-20th-century strobe experiments, which were once scientific, then countercultural, later aesthetic (Canales 183). As the strobe migrated from lab to dancefloor, it carried with it the ghost of altered states, mescaline dreams, and Beat experimentation. In a 1958 Cambridge trial, subjects exposed to flickering light reported visions of microbial life —floating forms without depth or logic (Canales 183). Such images are "object-like impressions" (Massumi), sensory apparitions with form but no fixity, hovering between hallucination and substance. Through light, rhythm, and sensory overload—or what Rubin termed "calculated bombardment"—they create immersive experiences that extend perception into altered, affective territories where the seen and the felt blur. Through rhythm, intensity, and the calculated bombarded

chaos of light, they sketch a new networked sensorium where the intangible becomes momentarily felt, and the real flickers in and out of phase. Recursive rhythms and trance-inducing pulses act not merely as stylistic flourishes but as ontological ruptures: moments of 'ontological shock' (Tillich; Noorani) that short-circuit or circuit-bend the machinic and rewire sensation and/or perceptual parameters.

Figure 4: Dreamscape Flyer from the year 1995. The Peter Rubin Collection: Amsterdam. Courtesy of Eye Filmmuseum

Teetering between proprioception and vertigo, ontological shocks intrinsic to folded distance induce affective registers of techno-aesthetics that elucidate what Anna Munster refers to as "network anesthesia" (Munster): where rhythmic ecstasy and numbing simultaneity converge. This somatic network-disorientation functions as

both a “technique of ecstasy”—as seen in the promotional marital of the rave *Dreamscape* (see Figure 4)—and a numbing simultaneity of nodes, links, and flows that obscure relationalities from the local to the global. This techno-ontological shift marks a transition from localised sensory experience to generalised perceptual saturation, where visuality is both expansive and anesthetised, immersive and opaque. This political-aesthetic shift marks the technological transformation from linear input/output models to implementation of recursive feedback loops, expanding distances and fostering *distributed intimacies*. In networked aesthetics and AI-driven media, however, shock is no longer episodic but ambient—produced through recursive algorithmic mediation, unstable images, and machinic authorship that destabilise the subject’s grounding in space, time, and perception (Denson; Munster; Chun).

In the technosphere, the entanglement of *networked aesthetics* and the constellation of audiovisual data sets now constitute machine learning sequences, pipelines, and inferences of interoperability: aggregate relations between audiovisual sets persist. These sets, as Munster and Adrian MacKenzie suggest, constitute moments where the ceaseless flow of images is momentarily captured and transformed, marking a threshold between perceptual flux and operational meaning. Affective registers of networked techno-aesthetic operations thus construct an immanent territory constituted by a spatio-temporal energetic urban architecture—a virtual grid or transarchitecture (Novak) where "code as architecture works to structure the boundaries, as well as regulate the flows, of the internet traffic" (Cheney-Lippold 166). The scaffolding of these global communication networks relies on standardised protocols and predictive algorithms for interoperability in ways that exceed human perception, reshaping environments and folding human subjectivity. These media systems, subsequently, embody a tension between determination and indeterminacy as they act as more than tools, actively reconfiguring the conditions of corporeal existence. This “correlative capture” (Denson 40) intertwines phenomenological and statistical forces, embedding political structures in affective and aesthetic realms, shaping and augmenting collective and individual norms. Proprioception—the body’s sense of spatial orientation—becomes redefined through vestibular reconfigurations within global network environments. Drawing on Merleau-Ponty’s corporeal phenomenology, Shane Denson explains that the “spectators’ bodies act as filters, distilling visual phenomena from a range of extraperceptual facets” (Denson). He continues, “in particular, bodies react to invisible algorithmic infrastructures, which, in the case of machine learning algorithms, also operate as filters in their own right. The collision of metabolic and computational microtemporal operations calls forth a number of embodied affects, ranging from sublime awe to disorientation, cringe, and uncanny feelings of relational and environmental entanglement” (Denson 1). The body’s affective register of this "city-like" infrastructure of aggregates thus affords boundaries upon not only sensation or movement, but also embodied perception and identity. Thus, embedding individuals into a recursive algorithmic structural system while simultaneously shaping the possibilities for emergent forms of (sensorial) engagement within networked folded distance(s). Augmented by

audiovisual technologies, proprioception thus becomes a mediated act (Fedorova), extending the body's sensory reach into mapped virtual dimensions. Akin to the flicker film, this augmentation disrupts the equilibrium of center and periphery by producing a sensory disorientation that recalibrates the digital subject's relationship to space and time as well as the collective and self. Olga Goriunova explains how traffic of this virtual (tracked) movement defines the *digital subject.* Namely, by situating subjectivity in "an abstracted position, a performance, constructed persona from data, profiles, and other records and aggregates." (*Digital Subjects: An Introduction* 126) Recursively affording a dual shaping of the algorithmic infrastructure (or 'grid'), via movement through the global communications network, as constitutive of subjective perception and affective embodied dimensions. This political-aesthetic shift signals a technological transformation, from linear input/output models to recursive feedback systems that implement and extend distance as an operational affordance. Within this expanded architecture, the *eurhythmic* gives rise to *distributed intimacy* and other distributed forms of attunement. Eurhythmia, when aligned with the collectively entrained body—on the rave floor, in protest formations, or in digital swarms—reveals an affective mode of synchronization shaped by techno-aesthetic infrastructures (Jaques-Dalcroze; Banham). Networked ecologies of rhythmic space, composed of hyperlinked techno-aesthetics, become sites where the eu-rhythmic body emerges (Lefebvre), marking a move away from fixed choreographies toward situated harmonics that resonate across media interfaces, infrastructures, and spatial architectures. This distributed body clusters in folded proximities, with entrained participant embedded in networks of technologically mediated collective sensation. Returning to Deleuze's notion of subjectification, folded distance becomes the catalyst for eu-rhythmic modulation, acting as interplay for proximity and for dispersal that continually recalibrates embodied affect, perception and relational subjectivity.

Conclusion: Folded Relations in Soft Architectures of the Now

Across rave architectures, digital aesthetics, communication infrastructures, and platform protocols alike, affective sensation loses fixed linear and geographical coordinates. Rhythmic entrainment becomes a mode of dispersed yet collective individuation, a field of distributed intimacy where sensation folds and circulates between bodies, interfaces, (virtual) circuitry, and across recursive loops of light, sound, and code. These are architectures of *folded distance* are where subjectivity emerges through recursive relation and where presence is glitched, echoed, ambient, refracted. Rhythmic entrainment—the body moving with sound, the VJ's hand splicing visual flickers to the beat—restructures proximity as affective latency and re-maps sensorial affect, engendering a layered topology threading collections of globalised sensorial assemblages.

The techno dancefloor acts as a media archaeological site in this soft architecture of media infrastructure and digital aesthetics and their affordances of distributed

intimacy and techno-ontological affect. In these virtual spaces, relationality is buffered and constantly mediated with latency and lag.

Rhythmic recursion as the fold operates as an ontogenetic logic of modulation where the contingent loops of sensation, system, and subject co-compose the consensus of the Real. Folded distance thus marks the contemporary condition of technologically mediated life, where subjectivity emerges from tracked, stacked and layered sensation, becoming virtually infrastructural. In digital ecologies, presence is no longer singular or embodied, but spliced, compressed, and routed through layers of latency, feedback, and interface. Techno-aesthetics extend beyond the rave's tactility and into the operational aesthetics and techno rhythms of everyday digital infrastructures, such as in platforms and communication networks, where the digital subject is shaped by the rhythm of pulses curated through feeds, notifications, livestreams, and biometric loops. Intimacy becomes engineered through impersonal cycles of coded attention, where closeness becomes perhaps a function of refresh rate or content velocity. Recursive media thus both simulates nearness as well as automates it. In doing so, it reconfigures the politics of relation through re-mapping the limits of proximity that afford affective sensorial experience. Techno territories where feeling is filtered, optimised, and abstracted into distant, formulaic, and anticipated patterns.

Folded distance thus persists beyond the club or screen. It permeates digital culture through the pulse of notifications, the infinite scroll of feeds, the curated tempo of livestreams. Recursive rhythms, in this context, are the framework for techno-ontological infrastructures. From Rubin's VJ sets to platform rhythms to AI-generated images, a shift in how techno-aesthetics operate surfaces as a critical site of inquiry as it artificially and generatively mutates. The vibe, once curated through embodied feedback, is now predicted and interpolated through latent data structures. AI remix systems translate atmosphere into vectorised resemblances. In this machinic fold, the VJ becomes a prompt. Bodies disappear into training sets and affect is statistical. Yet even here, the Fold remains. As Deleuze reminds us, the Fold is the site of recursive interiority formed by the inflection of the outside. The techno-aesthetic Fold enacts this topology through entangling agency, authorship, and atmosphere through an increasingly complex logic of globalization and new cartographies mapping of expanded proximities for sensational affect. Yet, whether analog or algorithmic, the question persists: How does aesthetic unity arise in systems without center? What becomes of resonance when the body is no longer proximate, but inferred?

Recursive techno-aesthetics produce proximity without nearness, rhythms without physical or tangible friction. They render intimacy spectral—felt, but dispersed. This is the melancholic edge, the sad design (Lovink, " *Sad by Design* "), of techno-ontology: the yearning for connection persists even as presence is endlessly mediated, unreachable, and untouchable. This recursion is bifuricated as a Janus-face that promises to hold potential. The techno-event, with all its synthetic intensity, becomes a site of diffraction or agential cuts (Barad 132) where rhythm

unsettles fixed boundaries. Yet, without critical reflexivity, this deteritorialization through recursive loops risks reinforcing the logics they might disrupt. As Hui cautions, recursive systems (may) merely mirror *acosmic enframings*—technological salvationism replacing relation with abstraction (Hui). To move forward, techno-aesthetics must reconcile rupture with repair, disorientation with consciousness as both vestibular and potentially grounding. This means resisting the fetish of recursion for its own sake, and instead fostering a techno-sensibility that critically moves with, rather than beyond, the world—across systems, scales, settings, and folds. In the end, techno-aesthetics offer not answers but questions that are tangled, pulsing, and recursive.

The question then remains: where, exactly, are these *folded distances* leading us towards?

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Biography

Megan Phipps is media research, writer, and PhD candidate at Philipps-Universitat Marburg and a member of the Research Collective 'Configurations of Film' at Goethe-Universitat Frankfurt. She was previously a Lecturer in Media & Information at the University of Amsterdam, where she also earned her MA in New Media & Digital Culture. She obtained her B.A. in Liberal Arts & Sciences (Humanities) at Tilburg University. Her work spans collection acquisitions for CLARIAH Media Suite, curatorial research at Eye Filmmuseum, and publication in journals like *Millennium Film Journal* and *PULSE*. Her doctoral research, rooted in new media curation, audiovisual archive, and media archaeology, investigates the evolution of techno-subcultures through audiovisual performance, with a focus on collective movement, spatiality, and digital cultural values. Her research interests include the history, theory, and philosophy of art, culture, science, and technology.

Induction Of Sonic Distance: Active Noise Cancelling Headphones And The Imposition Of Sonic Realities

Nico Daleman

Abstract

This text presents a series of theoretical examinations of concepts such as induction, noise and space as they pertain to a broader ongoing artistic research project entitled Noise Re(in)duction that explores the possibilities of noise reduction technologies as sonic material for artistic practice. The central argument of the project is that by artificially *reducing* acoustic noise and digitally cleansing sonic environments, Active Noise Cancelling (ANC) algorithms *induce* a different kind of noise into our perception of reality. This paper further explores this notion by arguing that the induced noise is manifested as a parallel sonic reality (a *sonic distance*) which, although sensible, is contingent to the biases embedded in the algorithm. Thus, the broader implications of the conceptualization of noise, distance, sound and reality itself are negotiated through noise reduction technologies and the induction of a sonic distance. These theoretical frameworks therefore seek to establish a solid foundation for an artistic and phenomenological exploration of the nuances found in contemporary audio technologies.

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Introduction

The increasing prevalence of Active Noise Cancelling technologies in our everyday life (from headphones to smartphone devices, smart speakers, virtual assistants, hearing aids and hearables, among many others) has a direct impact in the ways in which perceive and relate to our sonic surroundings. By actively processing, modifying, and (re)producing acoustic environments, these technologies create an alternative sonic reality that is presented as actual, but that is in fact a representation of a soundscape that further alienates the listening subject from an unmediated sensory experience. In the pursuit for an optimal signal transmission, the advancement of noise-cancelling technologies has paradoxically led to the emergence of other forms of noise that extend beyond the boundaries of its intended cybernetic and informational system. Despite being grounded on the wave physics' fundamental principle of destructive interference, the implementation of the relevant noise-cancelling algorithms within the digital realm remains opaque and complex, which is also further exacerbated by the dynamics of patent acquisition and competitive market forces. As it is the case with many other computational processes that are a part of our everyday lives, there is an element of faith in the accuracy and representational capabilities of these devices. However, how much can we really trust our perception, when the perception itself gets mediated? How do digital algorithms mediate the impositions of perception? And how could they reinforce and induce preconceived social biases of race, gender, ability, and class into the perception of soundscapes?

This paper sets a theoretical ground for understanding the ways in which ANC technologies induce a form of noise that is manifested in a sonic distance which is also contingent to the biases of predeterminate algorithms. That is, in order to understand the broader consequences of ANC technologies in our interconnected and hypermediated social dynamics, the concepts of induction, noise and space are in need of a re(definition).

The text first briefly describes the phenomenon of electromagnetic induction, as related to the functioning of audio technologies such as microphones and speakers, to then explain it in action on ANC technologies, including the different modalities that can be found in some of today's most common devices such as Sony's WH-100XM5 and the Apple's Airpods.

Theoretically, induction makes part of Gilbert Simondon's ontological framework of individuation, where *transduction* (different than induction or deduction) becomes the main process by which beings emerge (Simondon). In the understanding of the act of listening as a transductive process, ANC them becomes an affront and a hinderance to the nuances that allow this form of sonic individuation. Instead of allowing a transductive process ANC algorithms *induce* a different kind of noise into our perception of reality. Noise is therefore not only understood in relation to its acoustic and technical modalities, but also in its social, cultural, and aesthetic

dimensions. Supported on Olga Gurionova's and Henri Lefebvre's discussions of distance and space respectively, I argue that, in the case of ANC, noise is manifested in the form of a *sonic distance* which affects the perceptual relation of sonic spaces, understood in its broader spectral, architectural and personal dimension.

Following Mack Hagood's examination of contemporary soothing sound technologies, including ANC, I ultimately offer a perspective in which the transductive quality of the act of listening is truncated by the algorithm, thus inducing noise that manifests itself in sonic alienation and distance. *Sonic distance* is then presented not only as an act of acoustic isolation, but also as a technological affront to our sonic reality. This is archived through the deliberate prioritization of the cybernetic conceptualization of noise as an objective entity and the subsequent possibility of control and personalization that restructures social dynamics.

Ultimately, I present noise reduction algorithms not as an invisible tool to improve a prescriptive listening practice imposed by tech corporations, but rather as a visible and tangible tool that can be challenged through its reorientation as musical and artistic material, as referenced in my ongoing artistic research project "Noise Re(in)duction."

Active Noise Cancelling (ANC)

The fundamental underlying principle of noise-cancelling technologies is grounded on the phenomenon of destructive interference, which occurs when a signal is summed with a phase-inverted copy of itself. In its most basic form, ANC Headphones function by capturing environmental sound through a few tiny microphones, inverting its phase and summing it to the desired signal (e.g. music or speech). Most contemporary devices use a combination of microphones both outside and inside the headset, creating system of feedforward and feedback. The exterior microphones are responsible for capturing ambience noise, while the inside microphones capture the desired signal and the inverted ambient noise (see Figure 1).

The digital processing signal differs from traditional methods of damping noise (such as headphones or earplugs for noise protection), in that not only they aim to block directly the physical passage of sound to the timpani, but also in the lack of control on the amount of noise or signal that is damped. Conversely, the advent of more efficient and compact technology has facilitated the integration of computationally intensive spectral processing algorithms into consumer-grade devices. Digital signal processing enables a precise selection of the spectral characteristics of noise by applying methods such as least mean square (LMS) adaptive filters, noise profiling, spectral analysis and Wiener filtering, each of which is more or less effective against different manifestations of noise. For example, noise profiling is primarily employed for cancelling predictable and repetitive noise,

such as that generated by aircraft turbines or heavy machinery. Adaptative filters are frequently used for more unpredictable and sporadic noise, such as street noise or by-passer conversations. Contemporary solutions that rely on artificial intelligence models are often trained by gathering data on the user's surroundings and habitus. This creates a "scene" that anticipates the context of noise in specific environments. For example, the system can expect to hear dogs and babies in parks, telephones or doorbells in offices, and announcements in airports.

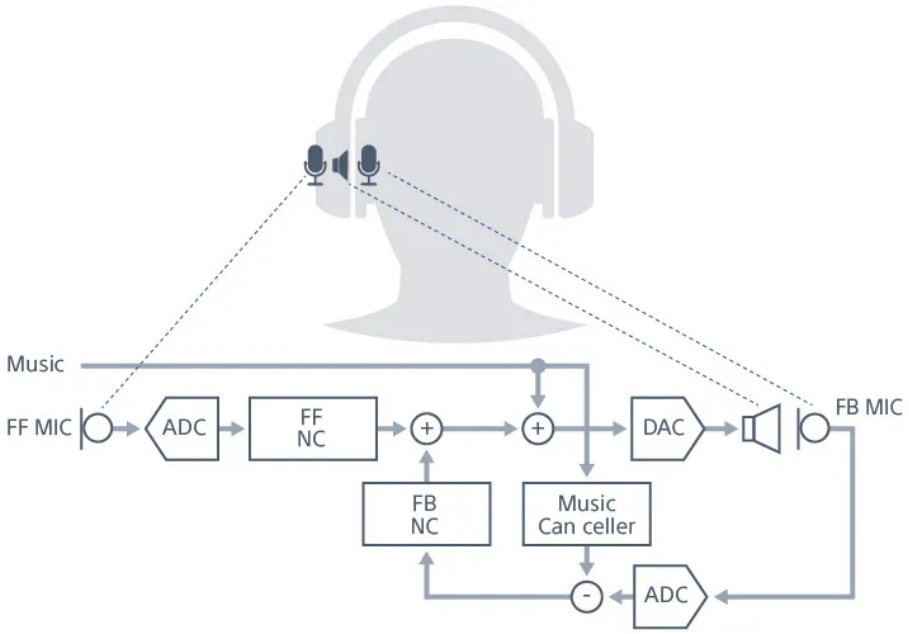

Figure 1: Sony's ANC technology for Audio. https://www.sony-semicon.com/en/technology/audio/index.html

ANC headphones can create accurate acoustic profiles of both the spatial soundscape as well as personal hearing profiles for bodies though a simple impulse-response process, which usually happens when turning the headphones on, by playing an initialization sound. Furthermore, ANC headphones offer a variety of functions and features, including personalised equaliser options, Spatial Sound Optimization for consumer-based spatial sound formats such as Dolby Atmos, based on data gathered from gyroscopes and accelerometers included in the devices circuitry, and the creation and selection of different quotidian soundscape profiles (e.g. home, office, jogging, gym, etc.). ANC headphones often provide the possibility of additional experiences through personalization through an accompanying mobile phone app. This includes Active Noise Awareness, voice interactions, and virtual assistance. The user interface of the app becomes a sonic interface thought the use of headphones.

A compelling feature of contemporary ANC headphones is the implementation of a so-called *Transparency Mode* (in Apple's Airpods) or Ambient Sound Feature (in Sony's WH-100XM5). Unlike traditional noise cancellation, which aims to suppress environmental audio in order to create an optimal acoustic environment for the transmission of a signal, transparency mode actively captures and enhances certain external sounds, allowing the users to remain aware of their surroundings

without removing the devices form their ears. The implementation of a transparency mode depends on a complex process of digital signals in which the physical isolation provided by the headphones must be compensated for by the (re)creation of ambient sounds, ensuring that the user perceives these sounds "as if" they were not wearing the headphones. Transparency mode is one of the main features that differentiates current ACN headphones from previous models. It is, therefore, one of the main features marketed by Apple, Sony and many other developers. While previous models marketed the access to a private sonic space, where silence and tranquillity was the norm, current models are directed towards the possibility of a sonic ubiquity, where the individual could switch at will between different sonic profiles.

The experience of listening though noise cancelling algorithms then varies from device to device. However, in both pure noise cancelling and transparency mode, there is a double process of *transduction* in real time, from acoustic to digital and back to acoustic, which aims to make the device that produces the medium invisible. To explain the intricacies of the ANC and its consequences on the listening experience, a discussion of some basic concepts that permeate the functioning of audio technology is needed.

Induction

Electromagnetic induction is a phenomenon through which an electric voltage is generated by a changing magnetic field. This is the basic underlying principle in the functioning of microphones and speakers. In dynamic microphones, variations in sound pressure move a coil around a magnetic field, *inducing* an electrical voltage which is then transmitted as an audio signal. In dynamic speakers, variations in electrical voltage on a coil induce a magnetic field which results in the movement of an attached diaphragm, producing changes in air pressure. i.e. sound. These two inverse processes are indeed manifestations of a single phenomenon known as *transduction,* where one type of energy is transformed into another, in this case, acoustic energy to electrical energy and vice versa[1].

Gilbert Simondon draws upon these physical concepts to develop his theory of physical individuation, where a metastable system is resolved by developing its potential into a structure (Simondon 5). For Simondon, induction is a unidirectional epistemological process that generates plausible generalizations derived from individual observations, therefore requiring a loss of information (15). In ANC, the unidirectional inductive process is exemplified by the transformation of ambient sound into a simulacrum of reality. The outcome of this process is pre-determined by the observations embedded in the algorithms and then presented as a virtual reality, disregarding the information that has been cancelled as unnecessary.

Conversely, transduction provides the basis for an explorative form of thought which is not necessarily teleological or linear. Simondon expand this definition to include “a physical, biological, mental, or social operation through which an activity

propagates incrementally within a domain" (13), which also allows for reconfigurations of new structures without loss or reduction (15). Furthermore, transduction is the main process through which individuation is afforded, thus being able to actualise the multiple possibilities of a metastable system.

ANC's inductive algorithms that process the acoustic environments therefore negate the processes of transduction, not only by producing a loss of information, but also by negating the process of individuation, replacing potentiality with determinacy. In Simondon's words: "the veritable limit of induction is plurality in its simplest and most difficult form to cross: heterogeneity. As soon as inductive thought is faced with this heterogeneity that it must resort to transductive thought" (Simondon 127).

Within this framework, the act of listening is regarded as a fundamental transductive act, not only in the actual transformation of acoustic energy into electrical neural signals, but also as a process of individuation: as the potential of creating auditory scenes by resolving the metastable possibilities that the soundscape provides. The act of listening as a transductive process involving intuition, discovery and becoming, serves as the basis for an exploration that "discovers and generates the heard" (Voegelin 4). In contrast, the inductive method imposed by ANC delegates the potentiality of the soundscape to the algorithm, becoming the arbiter of perception, and thereby negating access to the nuances of noise and the soundscape itself.

Sonic Distance

Considering listening as a fundamental Simondonean transductive act invites to conceptualise *sonic distance* from a phenomenological perspective that prioritises spatial and embodied listening and negotiates between malleable relationships of different acoustic realities. Similar to Olga Goriunova's conceptualization of *distance* as a non-representational notion that negotiates "between digital subjects and the human entities and processes they are connected to" (128), I consider *sonic distance* as a relation between two distinct modes of perception: a commonly perceived reality, and an algorithmically altered one, the last one which is only accessible by the inductive processes embedded in ANC. While Goriunova is interested in the distance between the "digital subject"[2] and the human being, the distance generated by ANC occurs between a "digital *acoustic* subject*"* (a digital representation of the data gathered and processed by ANC Headphones) and the sonic actuality of soundscape. ANC not only encourages a *sonic distance* through sonic alienation and the imposition of an inductive sonic reality already determined by technology, which carries the implicit biases of its teleological functioning. ANC also introduces a form of distance that goes beyond a pure physical realm and affects directly the sonic profile and footprint though which human and non-human agents create a relational dynamic through sound.

Following Henri Lefebvre's categories of space (Lefebvre 38-9), I would further argue that ANC disrupts the perception of space at its three main levels: spectral (conceived space), architectural (perceived space), and personal (lived space).

From a technical perspective, ANC headphones disrupt the conventional conception of spectral acoustic space through a series of digital processes that include analogue-digital and digital-analogue conversion, adaptative filtering, and destructive interference, all of which modify the and spectral and spatial qualities of audio signals and surrounding soundscapes. The cancelled spectral space of the signal subsequently becomes a negative space deemed as noise, which favours the idealised signal through a deterministic process of deconstruction and objectification, a signal that exists between the real and the synthetic, where information is actualised as the ideal entity of the cybernetic project: immaterial and disembodied.

This spectral space is analogous Lefebvre's conceived space, an abstract representation of audio and soundscapes as numbers, samples and digital processes. ANC challenges this conceived space by obscuring its processes of transformation, and by altering the pre-conceived forms of capture and reproduction of audio signal. In the context of speech transmission and telecommunications, ANC creates an enhanced form of "acousmatic" or schizophrenic voice, by taking it out of its context and (re)creating it as a purer form of itself. (see Kane). In the musical context, ANC attempts to replicate the High Fidelity conditions prevalent in recording studios such as acoustic isolation and controlled reverberation time. In listening to ANC, the user has access anytime anywhere to the HiFi promises of experiencing music "as if" it was listened in the recording studio. These spectral modifications and re-creations do not reconstruct a real space, but rather simulate one based on the references of its acoustic and spectral configurations, i.e. create a simulacrum.

The spectral non-space that alludes to the HiFi audio quality and optimal recording studio acoustics, negates the context of environmental sound, and thus challenges the conception of architectural space. For Lefebvre "the spatial practice of a society is revealed through the deciphering of its space" (Lefebvre 38), that is, the quotidian relations between private and public sphere are revealed through the activation of places and forms of transit, leaving behind a sonic trace characteristic of their sonic persona (Schulze 123). ANC's negates access to these spaces and practices, which is achieved not only by confining the individual to their own headspace, but also by creating a negative architectural space, a *non-space*, in which only sounds deemed worthy of containing information are allowed to be reproduced. Non-spaces are described by Marc Augé as "a space which cannot be defined as relational, historical, or concerned with identity" (Augé 63). Consequently, the non-space offered by ANC also negates a phenomenological perception of space, by separating not only the signal from its context, but also the listener from his spatial context, from his embodied experience.

For Lefebvre, space is produced in time, i.e. it is historical. Therefore, the non-space of ANC is not produced in time, it is always already there. While the soundscape of the non-space may be contingent to the nuances of its particular context, the results are always the same: the user is transported to a ubiquitous ahistorical, non-space of noiseless purity where time and space do not exist. As it is the case in malls and shopping centres, the sonic non-space produced by ANC it's the consistent across locations, and its expectations and experiences are the same whether the listener is located in Berlin, Bogotá or Bandung, listening today or ten years ago. The negation of architectural space is even more present in transparency mode, where the reproduction of the environment is outsourced to the algorithms, presented as pure information which is disembodied and non-relational. This non-space becomes non-existent in re-produced signals, alienating the signal from both its original source and its context.

Third, ANC presents an affront to personal space. Through transparency mode, the transformation of personal space it is not a simple negation of a social space, but rather an active awareness of one's surroundings, enabling its re-productions and the actualization of a non-place. Isolation and personalization thus negate the social relational dynamics that take place in urban and social contexts. ANC then negates the relation with the lived spaces of Lefebvre through "associated images and symbols" and challenges the "more or less coherent system of nonverbal symbols and signs" (Lefebvre 38). This is exemplified by the mediation of interactions afforded through transparency mode; when users engage with conversation while wearing headphones, there is a disruption in the nonverbal cues and expectations of communication.

Furthermore, ANC intersect with other forms of sonic technologies in what Mack Hagood calls "orphic" sounds (Hagood, "Hush"), that is, soothing mechanisms to combat the increasingly noisy environments and stressful lives of post-industrial societies. These include not only ANC technologies, but also natural soundscapes, various forms of drones and noise, and so-called binaural beats. Wellness-embedded sound devices also provide an experience of noise cancellation, an optimization not only of the signal, but of the subject itself. By cancelling out noise, the user protects his ears, is more productive, more relaxed, more themselves. Ultimately, it is a manifestation of identity politics in the form of an internal wellness culture.

The creation of this architectural, spectral and personal non-space afforded by ANC, brings implicitly and unintentionally attention to what is not there. For Simondon, indeed, "resolving transduction operates the inversion of the negative into the positive" (Simondon 15). Transductive listening then turns the negative (noise) into the positive.

Noise

Implicit in the design of ANC algorithms is a conceptualization of noise as an objective entity, based on a definition of noise as a measure of the probability of information, as proposed by Shannon and Weaver (1964). The quest for a "pure" signal has encouraged communications engineers to devise methods for optimizing message transmission. The relationship between noise and signal (c.f. signal-to-noise ratio) can thus be measured, quantified, and objectified, positioning noise as the opposite of signal: an unwanted, *othered* entity. Noise-cancelling algorithms participate in a dialectical relationship between imposed social and cultural binaries, reinforcing these very demarcations.

The ideological consequences of conceptualizing noise as informational entropy account for biases gender, race, and class biases, among others (see Malaspina). Tina Tallon points out how the signal filtering implemented in the early days of mass landline telephony was optimised with the white male voice in mind, producing undesirable (shrill) results for female voices. (Tallon). Similarly, current digital voice communication technologies such as Zoom or Facetime implement significant processes of filtering, compression and noise reduction, as well as anti-feedback algorithms that modify their input for optimal transmission. Likewise, digital compression codecs such as MP3 have compressed and filtered parts of the recorded audio that are considered irrelevant in a psychoacoustic sense, in favour of a smaller, more portable and efficient data format for transmission (Sterne).

Noise, therefore, needs to be expanded into a broader definition that goes beyond the acoustic and informational, and that includes its social and cultural manifestations. For instance, Cécile Malaspina (2018) distinguishes between noise as a qualitative measure of sound and a quantitative measure of information in relation to noise, the former measuring noise as an object of perception, the latter measuring a relation of probability. Within sound studies, the phenomenon of noise is often seen as culturally and historically contingent (see Attali, Hegarty, Voegelin, Hainge). As Mack Hagood puts it: "Noise is othered sound, and like any othering, the perception of noise is socially constructed and situated in hierarchies of race, class, age, and gender." (Hagood, *Quiet Comfort* 574). Meanwhile, for Jacques Attali noise is violence, disruption and disconnection, an interruption of a transmission (Attali 26) that denotes relations of power and control (Attali 123).

This socialization of noise is most present in the demarcation and construction of human bodies, and it is even more present in the control and regulation of racialised and queer bodies. Salome Voegelin compares the bodily effects of noise and silence, positing them as opposites: "Noise pushes vertically down my body, compressing my chest and propelling me outward into my breathless bodily fantasy. Silence, on the other hand, enters me and pulls me inward and outward, stretching my nervous system through thin layers of skin, hooking my inner flesh to the outer edge of my body" (Voegelin 86). The numbness caused by noise is then turned

inward, creating an individual space of self-protection without the possibility of relating to the outside world. The elimination of this noise is then desired, with a longing for its opposite, silence, which creates an outward awareness of our surroundings.

Nevertheless, Noise Cancelling Algorithms do not provide the experience of silence, but of "non-noise."The possibility of a "Cagean" silence that expands listening into a possibility of meaning, as described by Voegelin, is denied in the resynthesis processes of noise cancelling algorithms. ANC imposes its own version of reality by assigning a predetermined meaning and preventing the possibility of exploratory listening. This is presented to the user as a form of control that is also pre-established in the (sonic) user interface. As Joseph Klett notes, "'Silence' does not mean silence 'out there' so much as it represents control over one's hearing 'in here.'" (Klett 124).

Contrary to the oppositional approach presented by Voegelin, noise and silence can be viewed as part of an ever-evolving continuum based on perception. The opposite end of this continuum is information, or the desired signal. However, in contrast to Shannon and Weaver's objectification, information can be conceived as a perceptual manifestation, based on a phenomenological approach to listening that prioritises attention and bodily experience as epistemic tools. By negating the complementarity of the noise-silence continuum, noise cancelling technologies have achieved the same phenomenological results as Voegelin's conceptualization of noise: “noise now, in its quasi inertia, is not about mass movement and progress, but about private and isolated fixity: listening on a heavy spot and pondering that position.” (Voegelin 43). That is, ANC force the listener into a unidimensional and homogeneous listening reality that avoids any potential for multiplicity and thus negates a perceptual perception of information. A reconceptualization and repurposing of its technologies is therefore needed to achieve ANC’s aesthetic, exploratory, and transductive potential.

Reduction

Musically, noise has evolved from the antithesis of music to a more affective and disruptive method of conveying numbness, discomfort, and discontent. (Voegelin 86). From Luigi Russolo's proto-fascist manifesto to the digital synthesis techniques of Iannis Xenakis to punk and Japanoise, various forms of "noise music" have developed their own aesthetic and confrontational discourse (see Hegarty) As such "noise-in-itself" is positioned as an artistic methodology, that implicitly valuates noise positively and positions the existence of "noise-music" as an aesthetic oxymoron, a metastable phenomenon.

Nevertheless, within the pervasive negative valuation that is ubiquitous in our cultural milieu, noise as the other has been the subject of several levels of systematic control and regulation mechanisms, of which ANC is the most recent example. The concept of *noise pollution* has been employed as a pretext to

pathologise and regulate loud and chaotic sonic environments, and even to present them as an aesthetic threat to the ecological preservation of soundscapes, as evidenced by the practice of R. Murray Schafer (Schafer). The purist form of listening encouraged by noise regulations is a direct consequence of the cybernetic objectification of noise and is one of many factors that reinforce the social and cultural paradigms underlying the development of noise reduction algorithms.

While R. Murray Schaffer proposes a return to purer soundscapes and the contamination of the environment by industrial noise pollution, Marie Thompson notes that the ways in which noise is represented take on a form of universalization, where all noise is seen as impure and immoral (Thompson). Thompson presents a series of counter-examples to the noise-silence ethical binary: Solitary confinement and silence are used as forms of punishment, and natural soundscapes such as the Amazon rainforest can be incredibly loud and disturbing (Thompson 100-1). Access to silence is then not only mediated by public order laws, by acoustic, architectural or urban dispositions, but rather refers to an access to control. The mediation of a digital process embedded in ANC is therefore not only a form of environmental control, but also a hyper-real actualization of an acoustic imaginary and its embedded aesthetic moralism.

From a phenomenological standpoint, beyond creating an optimal acoustic signal, ANC algorithms provide an *experience* of noise cancellation, regardless of the content of the signal. For instance, Spike Jonze's advertainment shot film “Someday” (Jonze 2025) exemplifies the ways in which ANC headphones are not just a technological advance or a Hi-Fi device, but rather providers of an experience of isolation that is made to be displayed in public: a kind of isolationist voyeurism that is at once individualistic and social. Mark Hagood considers noise-cancelling technologies as mechanisms through which personhood is created and reinforced, enclosing the self and protecting it from the increasing sources of environmental noise (Hagood, “Hush”). Hagood also distinguishes between traditional narrative media that entertain or inform, and current forms of media that not only seek to make the medium invisible, but also seek to make the content itself invisible, creating a perceptual absence (Hagood, “Hush” 22). That is, the digital signal processing of environmental sounds is presented as invisible, as an experience, even though a mediation is taking place constantly. Indeed for Hagood, media does not function as an invisible medium to carry information, but is rather an affective tool that alters “how the body feels and what it perceives, controlling our relationship to others and the world, enveloping ourselves, and even disappearing ourselves.” (Hagood *Emotional Rescue*). In Jonze’s commercial, when the ANC is turned on, Pascal is not transported to a completely new reality, but to an enhanced reality, more vivid, playing with the promise and hope of a better future.

Conclusions

The induction of sonic distance could be understood as an imposition rather than an unexpected consequence of a new convenient technology. The difference between regular headphones and ANC is analogous to the difference between Virtual Reality in which the subject is completely immersed in a produced reality, and an "Augmented Reality" where a see-through camera renders the landscape and adds and positions virtual elements into it. A regular stereo experience, such as that of the Walkman, can create a personal soundtrack or a "secret" that can only be experienced by the headphone listener. (Hosokawa).

Conversely, ANC, through a "hear-through" microphone (i.e., transparency mode), reproduces the soundscape and adds virtual elements to it (music podcasts, phone calls, etc.) This kind of "Sonic Augmented Reality" or "Sonic-Extended Reality" provides a fundamentally new experience, avoiding the isolation of the individual while directly affecting the perception of their "sonic reality." According to Hosokawa, the mystery is still there, but the listener can also eavesdrop on the shared reality (Hosokawa).

Rather than negating the environment by replacing its acoustic content, (i.e. replacing a soundscape with prerecorded sounds), ANC relegates the listening process of transduction and individuation to the contingent biases of the algorithm. The promise of an experience of individual calm is only archived through the simultaneous violent and disruptive imposition of predetermined biases of algorithmic mediation, i.e. the induction of noise. By replacing exploratory listening with a synthetic experience, this induced sonic distance not only alters our relationship to our surrounding soundscapes, but also induces "noise" in the form of alienation of our senses.

In ANC algorithms, Attali's noise as violence and disruption is manifested in the forced modification of everyday environmental sounds, such as crowds, traffic, soundscapes, that are predefined as noise. Nevertheless, taken noise as socially and historically contingent, ANC devices have the potential to reconfigure the sensory experience of noise, challenging its established socially constructed boundaries. The expansive nature of my ongoing artistic research project *Noise Re(in)duction* resulted in a non-linear basis for a diversity of outcomes and media manifestations. What started as an interest for the inner workings of noise reduction technologies has turned into an intermedial non-linear research project that manifests in lectures, performances, essays, installations around the topic of noise reduction. Some preliminary results have been presented in the form of lecture-performances and audiovisual installations. By making sensible these forms of sonic distance, the conceptualizations presented in this text acquire and additional dimension. This dimension is only be perceived, manifested and embodied within the scope of a speculative artistic practice that are being and will continue to be explored (see Daleman).

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Biography

Nico Daleman (Bogotá 1989) is an sound artist and researcher based in Berlin. His research explores the influence of music technology on current practices of contemporary music and sound art, focusing on machine listening, artificial intelligence, sonification, noise reduction algorithms, neuroaesthetics and trans-traditional music. He is an active member of the sound art

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Image Laundering: A War In-Between

Katya Sivers

Abstract

This essay examines the layered structure of digital images in the context of the war in Ukraine, with a focus on how foregrounds and backgrounds are visually and conceptually manipulated to shape perception. It explores how digital media technologies enable the censorship, fabrication, and weaponization of images, blurring the line between reality and fiction. Drawing on historical visual strategies from Soviet Russia and contemporary practices in Russian state media, the essay traces how power operates through what is shown, hidden, or erased. It highlights the role of computer graphics and social media in the hyper-aestheticization of conflict.

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A Censored Image

On 14 March 2022, three weeks after Russia's full-scale invasion of Ukraine, Marina Ovsyannikova, an employee of Russia's state-controlled Channel One, staged a rare and highly publicised anti-war protest during a live broadcast. During the evening news programme *Vremya*, Ovsyannikova walked in front of the cameras while the anchor was speaking, holding a handwritten poster that read: "No war. Stop the war. Don't believe the propaganda. They are lying to you here. Russians against war." The protest lasted only a few seconds before the broadcast abruptly cut away.

Figure 1: Screenshot from Vremya programme, Russia's Channel One, broadcast 14 March 2022.

Ovsyannikova's brief but impactful act disrupted the normal flow of images of Russian state television, which relies on meticulously curated backdrops and digital effects to maintain its narrative control. Positioned between the anchor and the backdrop, her protest exposed the constructed nature of the televised environment. Its apparatus typically includes interfaces that includes symbols, statistics, data visualizations, maps, digital collages, and manipulated images displayed in a manufactured studio setting that blends the physical and digital elements.

The event ruptured the layers of the televised image, revealing how media function as interfaces that transform and simplify complex three-dimensional realities into two-dimensional representations. However, Ovsyannikova's five-second intervention did more than disrupt the image – it deconstructed the very structure of two-dimensional media space itself. Her action prompted an immediate tightening of security protocols: live broadcasts were henceforth subjected to a mandatory one-minute delay. This temporal lag suspended broadcasting in time, enabling inspection and approval before release to audiences.

In the news articles that followed the event, Russian media censored the image by concealing Ovsyannikova's poster. The text on it was either blurred or covered with colored overlays. The anti-war statement was considered especially significant and fell under fresh oppressive laws that prohibit directly referring to the invasion as a war.

Figure 2: Screenshot published on 93.ru, an online media platform based in Krasnodar, Russia, 4 October 2023, with the words "No war. Stop the war. They are lying to you here. Russians against war" pixelated. 93.ru, https://93.ru/text/incidents/2023/10/04/72774863/.

Figure 3: Screenshot published by RuNews24.ru, an online news aggregator, 30 July 2024, with the words "No war. Stop the war. They are lying to you here. Russians against war" obscured. Dzen, https://dzen.ru/a/Zqj_oSMaR2FxjKYN.

The partial obscuring of an image is a direct continuation of visual censorship methods, which have a long history, particularly in Soviet Russia. In a state that emerged in a time of rapid technological development in the first half of the 20th century, images were systematically manipulated to erase purged figures and inconvenient events from historical records. A well-documented example is the progressive disappearance of Stalin's former associates from official photographs, as individuals fell out of favour and were subsequently erased through retouching – an act that paralleled their political repression. Another commonly employed technique was the deliberate obscuring of faces. The faces of "enemies of the people" were crudely blackened and thus erased from the visual record.

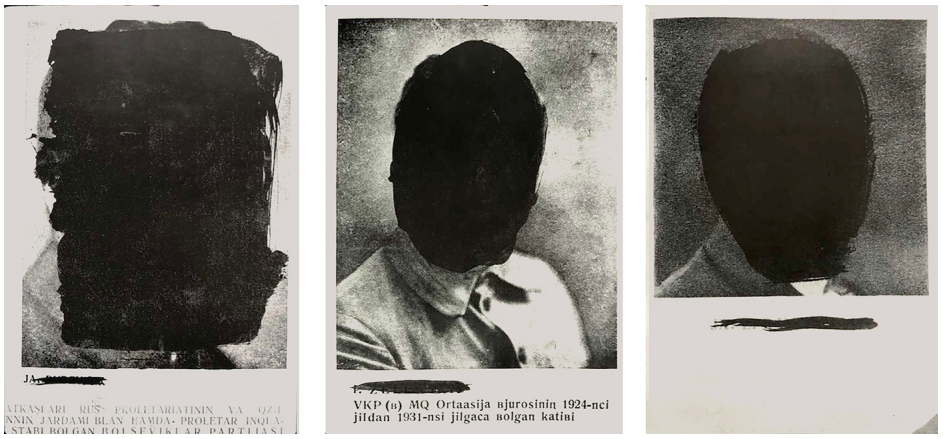

Figure 4: Obscured portraits from 10 Years of Uzbekistan, an album published in 1934. Campbell and King.

By the 1960s, techniques of redaction – black-out and white-out – had migrated into broader cultural practices. Conceptual artists and poets adopted these methods, turning obscuration, reduction, and deliberate omission into significant artistic strategies. Rather than rewriting or falsifying history, these gestures explored absence, silence, and erasure, seeking new forms of expression and communication.

Ilya Kabakov, a prominent Soviet and American conceptual artist, born in Dnipropetrovsk, Ukraine, and a key figure in Moscow's underground art scene during the 1960s and 1970s, offered a unique perspective on the notion of emptiness – or *the void* – from the standpoint of an artist who emigrated from the USSR to the West. Kabakov compares two distinct conceptions of emptiness. In the Western tradition, shaped by Enlightenment ideals of progress and human mastery, emptiness is perceived as a passive or neutral space awaiting human intervention. It is envisioned as "a bare table that has not yet been set" or as land "awaiting man's labor" (Kabakov 370). By contrast, within the Soviet political and visual regime, Kabakov theorises emptiness as an active and aggressive force. Rather than passive, this form of emptiness is parasitic – feeding on existence. He describes it as "a reservoir of emptiness… reducing existence to its antithesis, destroying construction, mystifying reality, transforming everything into… active nonexistence" (370–371).

Today, such a binary opposition is difficult to sustain within the politically nuanced and complex landscape. What Kabakov once identified as a distinctly Soviet phenomenon – the active, destructive *void* – has become a more universal condition, manifesting in response to political instability, institutional distrust, and systemic opacity.

A pertinent example can be found in the work of documentary filmmaker and journalist Laura Poitras with her artistic investigation into surveillance, civil liberties, and national security in the post-9/11 era. Her exhibition *Astro Noise* at the Whitney Museum of American Art prominently featured redacted government documents, obtained through Freedom of Information Act requests and lawsuits she filed to access records related to her placement on a government watchlist. In response, agencies such as the FBI released over 900 pages of material – many of them heavily redacted, with entire sections obscured under the pretext of legal or national security concerns. The redacted lines operate as evidence of concealment, revealing the act of hiding itself and distorting the viewer's grasp of reality.

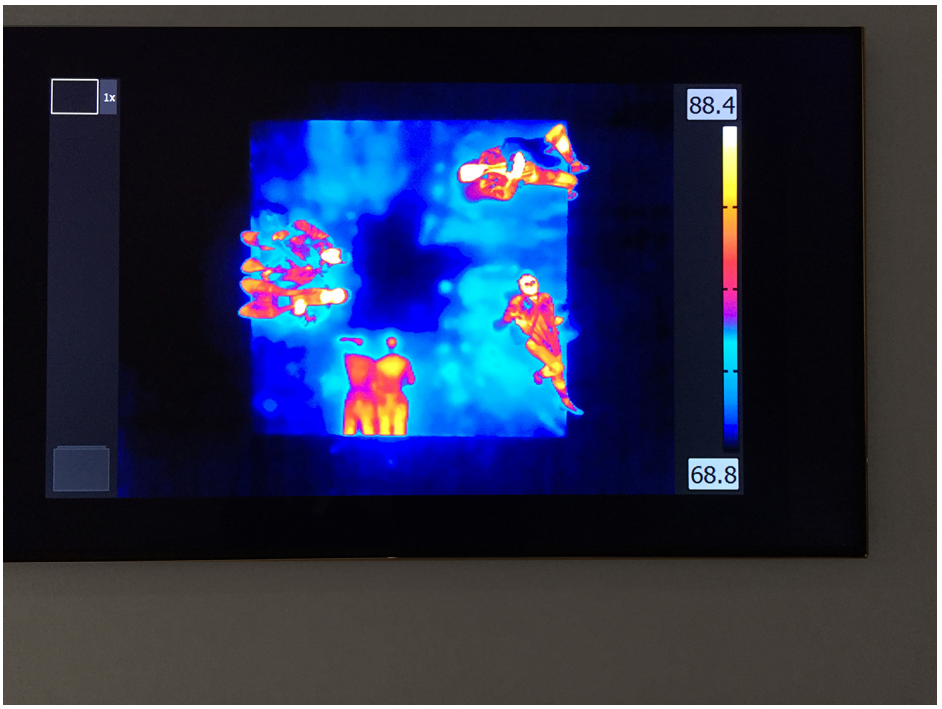

Figure 5: Photograph of Laura Poitras's work Bed Down Location featuring a video broadcast in which the author photographed herself, 2016.

Another work from the *Astro Noise* exhibition, *Bed Down Location* (2016), is a mixed-media installation that combines digital video, 3D sound design, infrared imaging, and closed-circuit footage to create an immersive surveillance environment. Visitors lie beneath a projected digital night sky, becoming vulnerable bodies under constant unnoticed observation. An infrared camera captures thermal images of participants, which are displayed on a monitor near the exit – delayed by several minutes – so viewers see their own image only as they are about to leave.

This temporal lag echoes the controlled delays employed in live news broadcasts discussed earlier. Unlike broadcasting, where such delays are concealed and serve political purposes, Poitras's work makes the delay visible and tangible: it implicates viewers on both sides of the surveillance apparatus – both as the watched and the watchers – heightening their awareness of the asymmetrical power dynamics embedded within systems of observation.

The drained individual agency – what can today be understood as *the void* – is precisely what various political regimes may rely upon, including those described by Kabakov and Poitras. Visual frameworks play an active role in this process, particularly through digital images.

A Digital Image in the Context of War

Emerged in the 1950s, digital imaging technologies were shaped by Cold War imperatives and developed within a techno-political landscape where visibility, simulation, and control became increasingly entangled. The origins of the digital image are inseparable from the context of warfare: early computer graphics were created to calculate missile trajectories, embedding computation in military objectives from the outset.

With the advent of screens, these technologies shifted from merely displaying information to becoming active simulation environments. Screens evolved into dynamic sites for visualizing complex data, enabling targeting, modelling, and operational control. Over the following decades, computer graphics developed from static representations into dynamic, interactive interfaces – integrated into everyday devices such as televisions, urban screens, and smartphones. At the same time, these technologies enabled new forms of pervasive surveillance, including CCTV, biometric systems, and facial recognition software.

While the Gulf War is widely credited as the first conflict to be mediated through real-time television broadcasting, with footage from cameras mounted on American aircraft transmitted directly to domestic audiences, the role of the image in contemporary warfare has since evolved significantly. Today, the digital image plays a central role in conflict, with the mass production and circulation of visuals turning media into what Donatella Della Ratta (97) terms "multipliers of violence." The war in Ukraine is unfolding within a social media–driven ecosystem, recorded and shared by countless personal devices. Although it is the most documented conflict in human history (Hoskins and Shchelin), this does not lead to its transparency – rather, the opposite. It is simultaneously the most sanitised war in terms of mainstream media and the least sanitised one in terms of social media platforms. This disjunction reveals not only a clash of ideologies but also a struggle over the aesthetic and emotional regimes of war.

Through social media feeds and notification systems, audiences are no longer distant observers but are emotionally and cognitively tethered to the progression of war. This state of constant exposure results in what Ford and Hoskins term

affective proximity – a condition in which individuals negotiate war's presence as it oscillates between the background and foreground of daily life. Much like subscribing to a streaming platform, individuals receive regular, algorithmically curated updates on destruction, survival, and resistance, becoming enmeshed in a war that is both overexposed and undercontextualised.

This process unfolds on platforms like Telegram and other decentralised channels, where grainy smartphone footage, GoPro recordings, and drone videos circulate widely – fragmentary and often unmediated records of war's visceral reality. Characterised by low resolution and chaotic framing, these images and videos carry a highly affective charge that pierces through their technical imperfections. Tens of thousands of such images and clips are collected, shared, and disseminated across networks, private chats, and news platforms, accompanied by systematic efforts to shape these visual streams. Telegram has become a particularly significant platform, hosting a wide spectrum of Russian channels covering the war in Ukraine – from openly propagandistic, pro-government war correspondents to channels run by servicemen and aggregators compiling so-called "patriotic" content.

Figure 6: Screenshots from a video published on the Telegram channel @voenkorKotenok, 8 June 2025, 17:50.

At the same time, Russian state television has developed a highly controlled approach to media representation, turning war coverage into a visually coherent and curated spectacle. Digitally produced or altered backdrops often replace the actual conditions of conflict, with anchors delivering narratives against these constructed visuals. Coverage tends to omit images of refugees and casualties, presenting instead a streamlined version of events in which military hardware becomes symbolic and abstracted. The representation of war shifts into a form of performance, where destruction is obscured by graphic design and simulation. This strategy exemplifies what Fuller and Weizman (84) describe as "the mediatic

condition," in which digital technologies are employed to destabilise knowledge and influence perception.

Figure 7: Screenshot from News at 2pm programme, Russia's Channel One, broadcast 20 July 2022.

Figure 8: Screenshot from Segodnya news programme at 7pm, Russia's NTV Channel, broadcast 20 June 2023.

The war in Ukraine has emerged not only as a geopolitical rupture but also as a media event, shaped by radical shifts in how visual content is produced, circulated, and received. The "relationship between violence and visibility within the participatory dimension of networked communications technologies" (Della Ratta 92–93) is once again being redefined. The convergence of media flows, technological apparatuses, and diverse human and nonhuman agents generates an informational spasm – an eruption in which the boundaries of reality become increasingly unstable. In this volatile interplay, reality is not merely represented but actively transformed, continually reshaped by digital and material forces. What is most unsettling, however, is the dissolution of the very line between real and

illusory. Everything – whether fabricated or factual – has migrated into the realm of the real, where even illusions are absorbed into lived experience, becoming indistinguishable from it: "everything has passed into the real, even illusions" (Fuller and Weizman 81).

Figure 9: Screenshot from Vesti at 8pm programme, Russia's VGTRK Rossiya 1 Channel, broadcast 19 December 2023

Figure 10: Screenshot from Vremya programme, Russia's Channel One, broadcast 19 December 2023.

Fabrication of Reality and Image Laundering: From Eisenstein to Simonyan

The fabrication of reality has a long and deeply embedded history in Russian cinematic and visual culture, tracing back to early Soviet filmmaking. One of the most emblematic and widely studied fabrications is Sergei Eisenstein's *October: Ten Days That Shook the World* (1927), which reimagined the 1917 Revolution a decade after the event. For generations, many viewers interpreted the film as a

documentary record rather than a heavily staged reconstruction. Commissioned by the October Jubilee Committee, the film became one of the Soviet Union's most ambitious cinematic projects. Eisenstein's montage techniques – combining the *montage of attractions* to provoke visceral emotional responses with *intellectual montage* designed to elicit conceptual associations – constructed a stylised, ideologically charged narrative of revolution.

As technology began to develop, so too did the methods and materials of fabrication. The rise of digital media and artificial intelligence (AI) has ushered in a new era in which the fabrication of reality has become easier, more seamless, automated, and imperceptible than ever before. In this context, state-controlled propaganda networks such as Russia Today (RT) represent a significant frontier. In November 2024, Margarita Simonyan, RT's editor-in-chief, disclosed that a substantial proportion of the network's presenters are now entirely AI-generated[1]. According to Simonyan, these virtual personas – comprising artificial voices, appearances, and behaviours – were never based on real individuals. Also, RT has ceased employing human broadcast editors, instead delegating image selection and creation to AI systems. AI is also used for dubbing purposes, re-translating political speeches with synchronised lip movements to generate multilingual synthetic content.

This consolidation of narrative power through AI technologies marks a new escalation in the aestheticisation of propaganda. Hyperreal visuals, prioritising the act of representation over the content represented, transform journalism into an immersive experience devoid of accountability. The polished appearance of such broadcasts fosters a disarmingly persuasive realism, displacing fact-checking with affective resonance. Yet arguably, the most effective manipulations may not come from fully synthetic avatars, but from subtly altered footage of real anchors. These minimal interventions, free of perceptible digital artefacts, exemplify what forensic researchers refer to as "image laundering" (Mandelli, Bestagini, and Tubaro), a process by which authentic visuals are algorithmically transformed into synthetic outputs, with original traces meticulously erased.

Image laundering is not merely a technical phenomenon. It is an epistemic strategy of obfuscating knowledge: an algorithmic sleight of hand that conceals reality in plain sight. In this process, details are erased, rewritten, and multiplied, producing an unprecedented disorientation. This destabilising effect evokes a paradoxical sense of unease, similar to *the uncanny valley*, where subtle alterations undermine the viewer's ability to trust the image. The image's infinite capacity for mutation becomes its shield, while the viewer's growing suspicion fosters a state of cognitive and political destabilisation, in which natural curiosity is replaces with distrust.

This disorientation profoundly affects the relational fabric between participants in visual media. It echoes Ariella Azoulay's concept of the civil contract of photography, which frames the image not merely as a representational artefact but as a political practice structured by intersubjective obligations. According to

Azoulay, photography constitutes a “hypothetical, imagined arrangement regulating relations within a virtual political community” (23). This civil contract entails an implicit agreement among the photographed subject, the photographer, and the viewer, predicated on the possibility of mutual recognition and responsibility. The viewer is called not simply to look, but to respond ethically – to acknowledge the subject's condition and to engage in a shared world.

In the context of fabricated or algorithmically modified images, this civil contract is strained to breaking point, if we follow Azoulay’s perspective. When images no longer attest to any stable referent – when they are produced without a subject or witnessed event – the very grounds of that relational pact become compromised. The viewer can no longer discern whether there is a subject in need of recognition, or whether what they are witnessing is an illusion designed to trigger affect without responsibility.

Expanding on Azoulay’s argument, Matthew Fuller and Eyal Weizman introduce the notion of the aesthetic-political-epistemic commons – a shared space of visual and cognitive labour through which truth can be collectively reconstructed in resistance to state and corporate regimes of control. The commons, as they theorise it, is not a fixed or pre-given entity but a dynamic, relational practice that integrates forensic investigation, artistic intervention, and collaborative witnessing. It constitutes a form of counter-visuality that challenges hegemonic representations and assembles dispersed data points into new constellations of meaning.

This approach resonates powerfully with the nature of the contemporary digital image. No longer a singular or stable object, the image has become a mutable field of operations – layered, recombinant, and often indeterminate. In such a context, the ethical and political stakes of visuality demand rethinking. Responsibility for the image is increasingly diffuse; witnessing is mediated and fragmented; and the rights to alter, circulate, or interpret images are contested and unstable. These issues gain particular urgency in the age of AI-driven manipulation, where authorship is distributed across human and nonhuman agents, and the conditions of visibility are shaped by opaque algorithmic processes.

What was once a tangible photograph is now a fluid construct, a layered simulation in which distinctions between real and artificial, authentic and manipulated, are persistently blurred. Yet this very indeterminacy can also be mobilised as a critical resource. By foregrounding the contingency, constructedness, and multiplicity of images, we might begin to reclaim visuality as a site of contestation rather than submission. Rather than retreating into nihilism or nostalgia for lost referents, the task becomes one of assembling new forms of collective scrutiny and resistance – new contracts, however fragile, that reassert the possibility of shared witnessing in the face of systemic obfuscation.

The Layers and the Backdrop

This brings us to a related and equally significant concept: the layers and the background, considered from visual, informational, and conceptual perspectives. It recalls Arjun Appadurai's notion of colonial photographic backdrops as tools for experimenting with "visual modernity." Once passive yet pivotal, these backdrops now function as silent agents of visual storytelling, functioning as "symptoms of power relations" (Anikina 276). No longer merely compositional, the background becomes structural and affective, reflecting the condition of post-Soviet as theorised by Madina Tlostanova.

Tlostanova's work provides a critical epistemological lens for understanding the aftermath of Soviet modernity within broader decolonial frameworks. She critiques the limitations of traditional postcolonial theory, arguing that its Eurocentric foundations are insufficient to address the specific geopolitical and affective entanglements of the post-Soviet space. In its place, she proposes a decolonial approach that accounts for the hybrid legacies of Soviet imperialism and their entwinement with global neoliberal systems. Within this framework, the post-Soviet condition is characterised by a unique form of temporal dislocation and ontological instability.

Central to this condition is what Tlostanova terms *futurelessness* – the collapse of a collective vision of the future that once structured Soviet subjectivity. The Soviet project was built around a utopian horizon – a "radiant future" – which organised time, labour, and meaning. Its collapse has left a vacuum, a conceptual and affective gap. Tlostanova calls this absence a *scarred temporality*: time not simply broken or nonlinear, but persistently wounded, experienced through fragmented memories, deferred hopes, and an uneasy entanglement with the temporalities of global capitalism. In this landscape, the post-Soviet subject is suspended between nostalgia and neoliberal precarity.

Importantly, this condition is not merely personal or psychological – it is structural. It is shaped by political violence, extractive economies, and epistemic delegitimation. Following Russia's full-scale invasion of Ukraine, this condition has intensified. The post-Soviet background – once marked by ideological ambivalence and temporal stagnation – has re-emerged in heightened form: as the visual and affective infrastructure of contemporary warfare.

This in-between space – a political and cultural condition – mirrors the unstable relationship between foreground and background in a digital image. It is a liminal zone, like the one disrupted by Marina Ovsyannikova when she stepped into the frame of live Russian state television holding a handwritten anti-war sign. Her act ruptured the background's presumed neutrality, transforming it into the foreground and exposing the usually invisible infrastructure of propaganda as both visible and fragile.

This liminality also reflects a broader condition of spectatorship in times of war. Russian society, and much of the world beyond – has become habituated to living against the backdrop of a distant conflict: one that unfolds "elsewhere," but not "here," not "now." This habituation is not merely a product of ideological fatigue; it is actively cultivated. What sustains it is image laundering, a technique of visual sanitisation in which war imagery is curated, filtered, or algorithmically generated to erase trauma, aestheticise violence, and redirect affect.

In this context, the background is not simply ambient – it is strategic. The emotional and perceptual detachment it fosters is no accident. It is part of a broader regime of *hyperaesthesia*, a concept developed by Matthew Fuller and Eyal Weizman and to describe "a central tool of state terror" (Fuller and Weizman 89). This condition, in which sensory saturation paradoxically leads to emotional numbing, is cultivated through overexposure to destruction via state-controlled media, social networks, and synthetic imagery.

State power, then, does not merely manipulate images – it re-engineers the very conditions under which images are experienced and believed. In doing so, it imposes a new kind of contract: a revision of Ariella Azoulay's civil contract of photography, now recalibrated for the realities of cyberwarfare. As Dyer-Witheford and Matviyenko suggest, this revised contract is mediated by digital platforms, AI systems, and Cold War imaginaries. Thus, to live within this regime is to be surrounded by layers of misinformation, ideology, technological mediation, and historical residue. The image becomes a stratified object, composed of both visible and invisible surfaces. The background, once inert, now exerts a subtle pressure on perception. It is not merely what we look at, but what we look through. It frames, distorts, and conditions our relationship to reality. And in doing so, it calls for a new critical vocabulary – one that accounts not only for what is shown, but for what makes the showing possible.

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Biography

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Embodying Liminal Data Lives Encoding The Aesthetics Of Trans Bodies As Algorithmic Distance

Christoffer Koch Andersen

Abstract

The idea that algorithms are infinitely improving our lives is presented as an undeniable truth, but for trans people, algorithms have violent, far-reaching implications. Behind the veil of neoliberal techno-optimism, algorithms perpetuate colonial and cisnormative legacies that anchor a binary idea of life, wherein the possible 'human' becomes the white, cisgender human, which in return violates and denounces trans people from not fitting the binary codes embedded into and making up algorithmic systems. Instead of complying with neoliberal beliefs in algorithms or falling short on critique, this article theorises the aesthetics of trans lives as embodied *liminal data lives* as a strategy of sensing distance to algorithms from the tactical uncodeability of transness in opposition to the binary confinements of algorithmic technologies. Taking this stance, this article asks: How can we create spaces of distance to algorithms in a world inherently entangled with them, and how can the liminality of trans data lives allow us to consider (im)possible ways of living and distancing as forms of resistance to the reality of algorithmic violence in which we exist?

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Introduction: Algorithmic Ordering of Trans Lives

The claim that algorithms are objectively beneficial to our lives stands as an axiomatic truth presented by Big tech companies and global governments. Popularly, algorithms are sold as tools to fix, tweak, improve, and exponentially advance our lives, but to trans people, this promise is not a given nor a truth. For trans people, algorithms and the spaces they enable, are violent, and at worst, deadly. Behind the neoliberal veil of techno-optimism fuelled by international politics, nation states and Big-tech companies, algorithms learn from, revigorate and perpetuate colonial and cisnormative legacies of violence that anchor a binary default (Amaro; Hoffmann). Within this default in algorithmic systems, the only possible 'human' becomes the white, cisgender human – forcing transness out of existence from not fitting the encoded template and binary codes making up the valorisation of human life.

Contrary to the belief that 'AI' technologies are inherently novel, progressive and revolutionary, recent scholarship on trans experiences of algorithms has critically taken up how they reinscribe binary colonial markers of gender essentialism. For example, facial recognition software algorithms reject and re-essentialise trans faces (Keyes; Scheuerman et al), encode trans bodies as dangerous deviant threats in airport security scanners (Costanza-Chock; Wilcox *Bodies of Violence*), deny trans people access to crucial state welfare services, delete trans health data and create messy bureaucratic problems (Amnesty International UK ; Hicks; Waldman), intimately surveil trans identities (Keyes & Austin; Shelton et al.), erase trans existence through binary digital identification systems and platforms (Andersen "Wrapped Up in the Cis-Tem"; Dixon-Román; Raj and Juned; Shah), and enact transphobic feedback loops on social media (Rauchberg; Thach et al). Together, these algorithmic technologies share an enabled reiteration of colonial classification of humans along binary lines of life, which essentialise physio-phrenological traits of the body as corresponding to the gender binary as the singular comprehensible unit of algorithmic recognition, which reinforces systemic marginalisation of trans people and locates trans bodies as territories for surveillance.

Meanwhile, scholarship also attends to how both queer and trans bodies enact "small but playful forms of disruption such as the error or glitch" (Gaboury 485), glitch out algorithmic technologies, resist systems of surveillance and establish epistemologies of 'glitching' (Leszczynski & Elwood; Russell; Shabbar), productively 'fail' in algorithmic technologies to unsettle the categories of 'naming' (Bridges) and embrace the inherent subversive potential of embodying failure (Campanioni). This following article extends both the current scholarship that 1) unveils and criticises the embodied and sociopolitical impacts of algorithmic violence for trans lives, and 2) analyses the productivity of 'glitchy' encounters of troubling, messing with or failing through the algorithmic codes. Rather than merely focusing on the glitches, errors or failures of trans bodies in their encounters with algorithms, this article

seeks to conceptualise this relationship along a different axis of analysis. This article is interested in theorising the aesthetic promise and potential of trans lives and their data reality of liminality—the state of existing in-between spaces simultaneously as equally invisible/visible, visual/invisual, codeable/uncodeable and liveable/unliveable—to investigate what the digital fleshiness of trans lives entitles as an embodied practices of distance to algorithmic technologies. This foregrounds trans techniques of refusal, misuse, and disruption that work with, through and against contemporary algorithmic technologies, and as such, establishes a trans critique of algorithms.

Inventing the data body

Instead of conceptualising algorithms as neutrally coded artefacts able to present objective truths about the world, this article theorises algorithms as sociopolitically contingent artefacts that fundamentally "engage in fabulation – they invent a people, write them into being as a curious body of correlated attributes, grouped into clusters derived from data that are themselves fabulatory devices" (Amoore *Cloud Ethics*, 158) that construct fabricated hierarchised imaginaries of the world, and as a result, of the subjects entangled with them. Within this algorithmic age, these "flows of personal data—abstracted information—are sifted and channelled in the process of risk assessment, to privilege some and disadvantage others, to accept some as legitimately present and to reject others" (Lyon 674). Highlighting the algorithmically curated imaginaries of both people and the world reveal the contingent nature of trans people locked into their data shadows, where algorithms invent specific fabulas about trans lives. Algorithms invent and present trans people as if they are inherently unreadable, or even impossible within the systems, while claiming that they are incompatible with the idea of the human due to their inability to be correctly rendered by the same systems excluding trans lives from the possibility of being understood along the lines of humanness in the first place. Wilcox poignantly reminds us how bodies are not isolated from their political histories, so erasing "this process of materialization that makes it seem as if intelligible bodies are natural phenomena constitutes another moment of violence" (Wilcox *Bodies of Violence*, 8). The act of constructing trans lives as unrecognisable entities in algorithmic systems is derived from data limited to tell a certain story and are thus fabulatory devices that dis/allow specific truths about the world. Essentially, the invention of this incomprehensibility to recognise trans lives leveraged by algorithms likewise becomes a fabulatory device itself – a device that serves to legitimise a story about trans people as 'uncodeable' and dismiss trans lives as a naturally given and inevitable reality that cannot be different despite the histories and lived realities of trans people.

In addition to living in one's own data shadow, not only have some bodies been historically ostracised *through* data and *from* their own data, but this data is ultimately part of larger sociopolitical relations and interconnected technological networks, where it is profiled, circulated and translated across several databases – administrative systems, digital databases, bureaucratic documents, biometric

technologies and computational predictions that break the body down into coded digits. These sociopolitical relations inhabit the differentiation and hierarchisation that have disciplined the humanity of bodies (Weheliye), where this making and distinction of difference enact the multiplicity and specific production, circulation, cementation and possibilities of human data (and datafied humans) across various algorithmic assemblages. By weaving together algorithms and trans lives, it becomes possible to consider how trans existence contributes to novel spatiotemporal forms of thinking about the algorithmic augmentation of social order and human differentiation in our digital societies: not only is 'trans' a technology for mapping deviance in reference to binary life, but further a tool for ordering, classifying, and controlling the embodiment of the human solidified through the colonial imposition of gender binarity. In this sense, the question is, can this function of difference that trans encapsulates be made productive as a rupture to create embodied forms of distance to algorithmic violence?

At a crucial moment in time where algorithms are exponentially embedded into every facet of our everyday lives, and where they both prime global political imaginaries of human value and reinfuse colonial hierarchies of power, the disproportionate implications for trans lives must be investigated, but likewise must strategic techniques for curating distance to the algorithmic technologies themselves. This article is situated between two intersecting branches of scholarship – that on algorithmic violence and on trans experiences of and resistance against it – with the aim of contributing with a spatiotemporal digital orientation of trans bodies as liminal data lives in order to unveil the forces of algorithmic violence, as well as to provide a theory of the productive encounters that occur when the uncodeability of transness is inserted into algorithmic equations.

Living with algorithms while trans presents an inescapable reality and precarious unliveability only predicted to intensify the impossibility of trans lives. The question becomes, how do we carve out liminal spaces in proximity to, but away from the algorithmic gaze of death? How can we create productive spaces of distance to algorithmic violence in a world inherently entangled with algorithms? I suggest an alternative coded rupture from transness itself to conceptualise the aesthetics of living as trans and trans lives as *liminal data lives*—lives that inherently inhabit a digital space in-between two states of being targeted and dismissed—which operationalises a productive strategy of sensing distance to algorithms by keeping with the complex uncodeability of transness in opposition to the binary limits of algorithmic technologies. In doing so, how might this shift from mere 'error' and 'failure' to uncodeability allow us to consider alternative ways of living and creating distance as resistance against algorithmic technologies towards encoding trans liveability?

Coded Flesh, Coded Death: Algorithmic Violence and Binary Valorisation of Life

Algorithms are maps of technical instructions that order and classify objects and humans into fixed categories; embodied by humans that code them and through the humans implicated by them. Algorithms are immaterial infrastructures of predictions, yet "need to be embodied in some combination of human and/or machine [...] in relation to the systems of interpretation and to the bodies that do the interpreting and reacting to the information they provide." (Wilcox, "Embodying Algorithmic War" 16-17). Crucially, in relation to bodies, transness—with its infiniteness, messiness and mutability—works against the operational principle of algorithms and their binary definiteness, fixedness, and immutability, which renders trans people either hypervisible as a deviance or invisible and erased. This imposes a violent gendering of the human in accordance with colonial rules of classification as the decision over life and distinction of who should live and who must die by "performatively enacting themselves/ourselves as being human, in the genre specific terms of each such codes' positive/negative system of meanings" (Wynter 30). Under the contemporary code of the algorithmic reality, the white cisgender human represents a positive symbolic meaning of living, while transness characterises a negative impossibility of life. Algorithms essentially represent a computational figuration of the politics of classification; the act of classifying and sorting bodies as objects into neatly defined categories, which inevitably infuses an overwriting and exclusion of those who cannot be fitted into these strict categories.

Trans people exist as neither-nor in a liminal space within the computational order of life: On one side, existing as *codeable* by being hypervisible in deviating from binary code, which positions trans people as targets for violence through failure to conform to the necropolitical norms and logics underlying the algorithmic order of life and death. On the other side, existing as *uncodeable* in its authentic and fleshy entirety as algorithms cannot comprehend transness, but neglects and computes transness to not exist in the first place as a non-life left to die outside of the territory of life - in both instances of (in)visibility, transness is fundamentally uncodeable.

In this sense, the algorithmic entitles "identifying norm and multiple deviations from the norm [by deploying] an "architecture of enmity", a drawing of the lines between self/other; us/them; safe/risky; inside/outside" (Amoore, "Algorithmic War" 51). These affective senses of 'improper life' stick to transness in its aberrations from normative binary structures, hence the trans body is subjected to coded operations of elimination that mark the flesh and strip the trans body of its human possibility as a *coded death*. If algorithms resemble a war-like architecture of enmity, then trans represents the compulsory fleshy reference for enabling the algorithmic distinction of value. In the current algorithmic reality, "if war at a distance" produced a subject position of a viewer, "war as big data" produces the subject position of a user, that is, a subject that actively participate in securing the

system as a whole" (Hu 113). Trans thus functions as a *digital flesh* to securitise the structures of algorithmic technologies and legitimise their war on certain 'othered' bodies as a whole through its interlinked assemblages of information, data and digits that do not correspond to trans existence, but rather, render and interpret trans lives as a computational incomprehensibility. Here, I strategically utilise the term digital flesh to "reflect the structure of digital phenomena as a continuum of reality, instead of an empty space lacking reality" (Yoon 585) to emphasise how bodies are inscribed into the algorithmic systems that co-construct their embodiment. If "algorithmic techniques are concerned with anticipating [and curating] an uncertain future, then the logic of algorithmic war is one of identifying norm and multiple deviations from the norm" (Amoore, "Algorithmic War" 55). The logic of war needs deviations to be identified in advance, and this is what underruns the encoding of the trans body as an existing difference and deviance from the norm; the assumed stable and secure cisnormative body template of life.

Importantly, what I draw attention to here is an overarching differentiating order of embodiment predicated on the instrumentalised sequences of algorithmic necropolitical functions designed to configurate trans subjects as ontologically killable flesh and imminently uncodeable to the system, where "identity and subjectivity are stripped away from bodies; persons are objectified as their fleshy, material bodies." (Wilcox *Bodies of Voilence* 104). Transness, I argue, represents as an epiphenomenon of algorithmic processes of classification, sorting and ordering through abstracted code, references and proximity that turn trans bodies into data formations that deviate from the installed norms within the systems. This process pre-necessitates that rendering of trans bodies as 'threats', which legitimises their co-existing attribute of being coded for exposure rather than being coded as human. Through the operations of algorithmic technologies, which revolve around the "logistics in massive technical systems that work through the ability to abstract and optimize" (Parikka 31), algorithms appropriate the binary order of code as the framework of readable life, hence abstracting trans lives as malfunctioning data formations not apt with the system.

As a technical object expressed through code, trans bodies are rendered as uncodeable in the symbolic order of the binary code, thus alienated from themselves and their flesh from not being possible to be read as trans, as life, as human. As Pugliese puts it, "Not to produce a template is equivalent to having no legal ontology, to being a non-being; you are equivalent to subjects who cannot be represented and whose presence can only be inferred by their very failure to be represented" (14). Instead, trans bodies come to represent coded signs of falling through the cracks, as something away from what constitutes the human and what the human is supposed to be. In this framing, transness is rather—through its inherent computational uncodeability in its own right—read as an *absence* of human that must be eliminated due to the lack of humanness.

To the human witnessing algorithmic violence, this "radical absence [of humanness] is crucial to witnessing what is not there, or fails to materialise, or is destroyed, or

has died" (Richardson 153). Within the algorithmic reality in which we are situated, one must be algorithmically readable in order to exist and live. Far from distancing the human partiality from that of the code, algorithmic technologies insist on executing the predetermined configuration of the human based on colonial legacies of binary gender, which "embed the discursive, affective, and fantastic logics of war in all their racializing and gendering dimensions into the algorithm at every stage of its design, training, and operation" (Richardson 103). They are, in this way, inseparable from the violent production of gender that formalise and exercise the impossibility of certain lives as digital flesh coded for death, while employing an algorithmically augmented valorisation and systematically upholding the liveability of binary lives.

With these facets of coded violence in mind, by attending to the aesthetic-political potential of the liminality of trans lives rather than framing algorithmic technologies as simply failing to capture transness, how might we interpret this act of failure that trans flesh embodies—and the inherent partiality it reveals—as central to our unveiling and knowledge production of algorithms? I suggest that the coded trans flesh unveils a liminal data life that illuminates a unique property in its liminality that the algorithmic system cannot expect, predetermine or fully calculate, but a fluidity of life that runs between the codes. It is exactly at this liminality between the physical and the digital that the trans body arrives as digital flesh that is once appropriated and used by algorithmic systems to claim unrecognisability to target and legitimise war on the trans body as the logic of algorithmic war on deviant bodies relies on their presumed deviance to defend the war itself. On the contrary, this also enables the trans body to remove itself from its physical flesh and into the digital cracks as a liminal data life to speculate and simmer as a possibility of something different outside of the uncalculatable range within algorithmic systems. This liminality encoded through data creates a rupture where the possibilities of identification and life exceed the binary limitations of embodiment in the system and the digitally mediated boundaries to which life can be lived.

Liminal Data Lives: Aestheticising the Digital Trans Flesh as Algorithmic Distance

No system can enforce a fixed, undisrupted narration and computation of truth without cracks. Algorithmic technologies—despite their glaring appearance as territories of unambiguous domination—are places of messiness, frictions, interference and disruption. This reality is often concealed behind the myriads of efforts needed to make an artificial system of binary logics appear fortified as the truth, and thus not articulated as a feature or productive fragility core to the systems themselves. Through the disruptive potential of trans data lives, a rupture and opening into said fragility of binary code can be located and exposed through the inherent uncodeability of transness that creates a liminal distance to algorithmic code and binary life. The question is, how do we critically utilise this liminal data space that trans people embody to create distance and inscribe another possible sensing of algorithms?

As Fuller and Weizman argue, aesthetic investigations—in this article through the lived experiences of transness—have a twofold aim as they "are at the same time investigations of the world [algorithmic violence] and enquiries into the means of knowing it [trans lives]" (15). Utilising the aesthetics of trans lives as means of sensing the world of algorithms and critically questioning the harmful colonial politics underlying its expansion involve "sensing – the capacity to register or to be affected, and sense-making – the capacity for such sensing to become knowledge" (33). This operationalisation of aesthetics enables us to attend to the affective facets of trans lived experiences with algorithms and translate these experiences into productive knowledge for refusal against algorithmic systems. In this aspect, trans existence is infinitely "wielded […] as an invaluable mapping tool, a means by which origins and boundaries are simultaneously traced and constructed and through which the visible traces of the body are tied to allegedly innate invisible characteristics" (Chun 10). By default, this marks both binarity as an ontological necessity and operationalise a spatiotemporal colonial reiteration of a hierarchised social order: 'trans' then is not only a tool for ordering, classifying, and controlling solidified through the imposition of the gender binary that is mirrored by algorithmic code, but inflicts disruption by existing as a mapping technology for locating destructible deviance *and* resistance in algorithmic technologies.

Trans bodies embody and curate a crucial liminal data space—simmering simultaneously between two different places and states of being in and with data: visibility as targets of violence and invisibility from going under the coded radar. Firstly, this takes form in terms of codeability from being rendered as visibly 'deviant' and uncodeability from the computational inability to comprehend trans existence in holistic authenticity. The idea of codeability speaks to the fact that, despite the seemingly algorithmic inability to read trans lives, data is still produced about the trans body – in this instance, as a deviance, where the data generated come in the format of registered deviance from the systems' norms. Meanwhile, this means there is an inherent uncodeability of trans lives in algorithmic systems, where they are not rendered and understood on their own terms in a holistic sense due to the algorithmic inability to comprehensively represent and define them. While some data is always produced about trans people in their encounters with algorithms, they cannot be fully and holistically rendered in their total legitimacy without misrecognition, flaws or exposure to risks or being held to a cisgendered comparison.

Secondly, this tension relates to the liveability of trans people in their data. Liveability refers to the "holistic quality of life located at the trans body as situated in an algorithmic world, and in which ways algorithms complicate the degrees of (un)liveability under which trans lives are subjugated (…) [and] concerns how trans liveability is affected and through which different systematic, sociopolitical and structural hierarchies of power encoded into algorithmic detection and decision-making" (Andersen, "Beyond Fairness" 3). Liveability exists as a mode of inhabiting data that is always rendered in its perpetual precariousness and surveillant

assemblages inscribed with precoded hierarchies of power, where trans people are not represented as liveable on their own terms in the code despite living in their own right. In comparison to other lives, trans lives are especially targeted, which position trans data lives in a state of programmed unliveability due to that same data manifesting as coded procedures of exposure, exclusion and death.

In this way, trans lives—trapped within binary codes of life—inhabit a liminal yet powerful space of simmering and sensing the algorithmic world between the visible/invisible; codeable/uncodeable; liveable/unliveable as iterative modes of being that illustrate a significant and inescapable relationship between how trans bodies exist in the world and how algorithms interpret this existence as a constant coded negotiation between targeting and erasure. This relation between algorithms and trans bodies as a co-produced liminal distance begins at the point of dismissing, rejecting or omitting transness from categories necessary for the binary logics that undergird the operationality of algorithms. Existentially and algorithmically, this is essentially the coded trap that trans subjects find themselves in, or, phrased differently; the space in which they inhabit and sense, refuse, and distort algorithmic infrastructures. As exemplified by trans experiences, as trans lives interact with algorithmic systems—whether that be in facial recognition software technologies having trouble representing and verifying trans faces, body scanners at the border being stunted by the nonconformity of trans bodies, or state welfare systems glitching out on granting trans citizens access—they are inconvenienced by trans existence as this form of existence does not correspond with the preprogrammed space that lives are expected to inhabit. Altogether, in their various technical operations and attempts at rendering a tangible subject, the algorithmic systems are troubled, delayed and stunned by the interference from trans embodiment that they cannot account for, which speaks to the aesthetic potential of the liminal distance enacted by trans lives.

Critically, within this space, it "require[s] ways of knowing and being that refuse to be reduced to the limits of normative digital-social orders (…) [where] queer life originates in desiring and doing that which normative social orders situate as impossible" (Elwood 213). The conditions of 'error' or 'erasure' in contrast to cisnormative data lives encode a distance that encourages strategic fugitive tactics of refusal for algorithmic infrastructures to be resisted and reimagined despite seeming impossible under the current neocolonial techno-optimism; a space where algorithmic infrastructures are troubled, delayed, distorted, and glitched from how transness exists in/against the code. Transness embodies a particular kind of 'in-betweenness' that at once infiltrates the binary code, renders it futile as a universal truth and effectuates distance to the reductionist algorithmic readability of humanness towards redefining what it means to be(come) human. By not fitting into binary code, transness strategically falls through the coded cracks of life. Despite the rigid boundaries of binary code, the ambivalent liminality of trans data lives allows for transness, as *digital flesh*, to become fluid and fugitive between the algorithmic codes. In this way, transness activates a fugitive resistance against algorithmic violence from embodied investment in failure by occupying a

spatiotemporal position at both sides of the threshold of code utilised by algorithmic technologies; cutting over, falling through, going against and obscuring binary flows of code. At this dual threshold, a certain kind of productive and disruptive relationship is generated that alter what we understand as distance to, while inevitably in proximity to algorithms that only trans bodies can catalyse.

This points to a crucial technical inception between the lived experiences and capacities of trans bodies and the systemic conditions of algorithms; their interfaces, systems and infrastructures. As an embodied tactic of trans lives, this in-betweenness operates at the level of the trans body in its interference with the systemic conditions of algorithms. Through embodying difference, they fall through the coded line that cannot capture their lives, obscure the efficiency of code by not fitting into the system, work directly against and expose the absurdity of binary reductionism, and cut over binary code by embodying more than what the binary can encapsulate. Trans lives introduce a disruptive plasticity to algorithmic systems through "their very gaps and indefiniteness (avoiding over-prescriptive recommendations), adaptability (being able to reset, forget or stay still), and overlaps (preferring repetitions to reduce risk and increase security)" (Chevillon 5), which embrace the multifaceted and unpredictable connections of trans lives and their data traces. These tactical breakages occurring from this in-betweenness act as operations that contrast what is otherwise considered legible lives in the infrastructures and outcomes of algorithms. Instead, this reveals how these operations conflict the rigidity of algorithmic technologies by enabling a productive distance to the algorithms themselves from the ways in which trans people occupy a constant space in-between as lives never fully rejected or accepted by the systems.

By conflicting binary code, what kind of algorithmic distance does trans lives produce, and what does the liminality generate for the relationship between bodies and algorithms? Regardless of how encounters between trans bodies and algorithms occur, they exemplify the aesthetic operations as tactics of difference that trans people employ: When facial recognition software is failing on and dismisses trans faces as a part of their authentication process, the unrecognisability attributed to trans faces disrupts the programmed facial detection on binary metrics. When automated gender recognition algorithms singularly operationalise the 'essence' of gender only through essentialising it as binary, trans people utilise the visual aesthetics of difference to reject the auto-encoded singular logic of binarity. When body scanners at the border immanently locate risky deviance on trans bodies from not fitting the binary gendered template they are engineered to execute, trans bodies appropriate the space between the generated visuality of the scanner and sociopolitical gendered expectations inscribed into the system. When nation state data administrative systems lose trans data upon legal gender change from relying on the fortification of computable binary gender to function, trans lives upset both the digitalisation processes but also the rigid nation state conceptualisations of what categories of gender and citizenship mean.

Taken together, they make visible a fractionated relationship always in proximity, where trans bodies can reach and sense algorithms, but are only tentatively computed and never comprehensively understood in their own right, where the promise of life is rendered at a distance but not constituting a full liveable life, that nonetheless work to decode and expose the inherent limitations and coded violence of algorithms. By design, collection, translation, operations and gaze, algorithms mould certain bodies not only for exposure, but also as never possible as human in the first place (Wilcox, "Embodying Algorithmic War" 2023), as already-always incompatible and deathable within and incomputable to the systems that propagate, disseminate, and commodify global political imaginaries of hierarchised human value and liveability.

Trans Data Lives and Facial Recognition Algorithms

In the case of facial recognition, where the algorithm persistently fails to not only recognise trans faces, but through this computational inability also forward the absence of humanness, it creates a looming uncoded presence that can only be inferred by the very failure to be represented. As Trinh Minh-ha writes “invisibility is built into each instance of visibility, and the very forms of invisibility generated within the visible are often what is at stake in a struggle” (Minh-ha 132), forcing an acknowledgement of the constitutive outside of the binary gaze and rendering distance of algorithms. Similar to documentary practices and recording gaze of ‘seeing’, this idea of ‘making visible’ accelerates exponentially with contemporary algorithmic technologies for “seeing faster, all at once, and always more” (Minh-ha 131). This is translatable to the all-encompassing surveillant gaze of algorithmic systems, where there has to be an exclusion for there to be an inclusion in the system as they are inseparable conditions enabling each other.

As a prime trans example in Denmark, when I had to verify my identity through the Danish verification process linked to your personal digital identity (MitID), I had to take a picture of my passport and use their facial recognition algorithm to scan my face so it could cross-reference and match my passport to my face. Instead of—as algorithmic solutions are advertised—effortlessly verifying my identity by matching my passport to my facial scan, I consistently received error messages stating that the photo in my passport did not match the scan of my face after attempting to verify my identity countless times. At the time, I had been on testosterone for years, but my passport picture was taken pre testosterone, which made the facial recognition algorithm unable to recognise my face and thus authenticate my identity to the state after years on testosterone. Far from being an innocent system producing a simple technical error, this marks the reoccurring phrenological idea of pinpointing to physical facial structures as cornerstones of truth and as a tool for verifying someone’s *real* identity installed and packaged in a novel, automated format.

Facial recognition technologies assume seamless and accurate detectability, while presuming and maintaining an immutable conception of binary gender (Danielsson

et al.; Keyes; Thieme et al.). Globally and across Europe, facial recognition software has largely been seen as an effective tool by governments and agencies to ensure security, direct war, protect borders, and make identification easier (Guo; Opiah; Wagner; Wilson). This optimism persists despite several international organisations (see e.g. Buolamwini; Amnesty International; DIHR; Harding) consistently warn against the embedded injustices and underlying forces of harm that facial recognition algorithms reinscribe when utilised for border surveillance, state welfare access, military warfare, crime detection, and immigration policies that fortify racial and gendered violence. In terms of risks for trans faces, facial recognition technologies cause problems across everyday life as they are implemented at access points between state infrastructures, international borders and spaces of movements. Between these points of access, trans people experience infringement on their human rights through how facial recognition technologies misgender, target and directly fail on trans faces and deny their personhood, limit equal access and excessively profile trans faces as a problem of unsolvable illegibility, making facial recognition technologies "dangerous when they fail and harmful when they work" (Crawford).

Yet, trans lives reveal further configurations than the mere split between visibility/invisibility. Between the lives seen, registered and recorded by algorithms either as legitimate or targets for violence and those not seen either through invisibility or erasure, there is also the power of the in-betweenness, the art of living between the coded lines, the illegible absences, and the digital silences that make up the space between each code. This intersection of trans bodies, data and colonial relations of binarity reiterated through facial recognition algorithms persuasively alter what it means to essentialise and secure 'truth' through the presumed essence of binary gender. In doing so, this further establishes a productive distance to the algorithms themselves, and in this case, the aim of recognition through image generation. In these encounters, trans lives redefine the spatial dynamics of recognition, confuse traditional claims of material visibility, and expose the profound dissonances that determine the relationship between trans identities and algorithmic perception of humans. The spatiotemporal dynamics originally intended by this algorithmic governance is disrupted by trans faces in ways that neither the infrastructures of transnational Big-tech companies suspected, or national legislative agendas can accomplish, essentially reconfiguring the spatiotemporal dynamics of recognition by turning them into something unrecognisable. In this way, to what extent can trans lives disruptively reconfigure the spatiotemporal dynamics and orientations of binary algorithmic recognition technologies at large?

Trans Data Lives and Algorithmic Body Scanners

Regarding trans encounters with body scanners implemented at international borders and airport security checkpoints, as Shachar and Mahmood highlight, "Treating the body as the site of regulation and control of mobility is no longer a matter of science fiction. It is the reality of the here and now." (126). In this way, the body scanners put forward a move into the coded tactility of the flesh. These

algorithmic body scanners work on an essentialising coded template of binary gender that, when encountering transness, as trans people stand in and walk through them, renders a visual imagery of the body silhouette in comparison to the outline of how the default cisgender body is expected to look. As articulated by Beauchamp "The generic "OK" body (…) is one with four limbs and a legible gender presentation, and it is absent any additional materials or objects." (74). Held against this visual of the binary body, if any additional body parts are present that do not fit this template or if an absence of normatively expected parts is detected, an internal mechanism that flags the body as 'suspicious' and as a potential security threat that needs further inspection is catalysed in order to neutralise said threat potential to national security.

Upon walking into the scanner, trans bodies become dematerialised as flesh and reassembled into misrepresenting code that, by the algorithm, read and flag trans bodies as deceptive based on an encoded template corresponding strictly to that of a normative cisgender body as a location from where everything else is rendered in a dangerous deficit to (inter)national security (Beauchamp; Clarkson; Currah and Mulqueen; Hall and Clapton; Quinan). This encounter remediates the relationship between bodies and algorithms, where the physical positioning of the trans body in the scanner triggers the rendering as a 'risky threat' from not correlating to the programmed binarity of the system. As Drage and Frabetti notes, this threat "is often rendered analogous to the concealed sex/gender of a trans person in airport security who must be "outed" and surveilled to maintain public safety." (90), making the trans body the deliberate target object through which political and affective senses of proximity to national security are mediated and maintained. As Wilcox ("Embodying Algorithmic War") poignantly argues in relation to the attachment of 'threat' to the trans body, "The construction of certain bodies as threatening is thus less a matter of what is known about them than a desire to make bodies into what we already know they must be" (22). Trans bodies must be deviant threats to maintain regimes of security.

However, despite this technical rendering of the trans body as a threat in the automatic comparison to the constructed safety of the cisgender body accentuated by strings of trans and queer scholarship, the trans body catalyses an alternative form of embodiment that challenges the system. To the system, the material tactility of the trans body forwards a liminal distance that halts the body in proximity to the algorithmic operations of locating (in)security. Within this operation, this leaves transness as an embodiment that catalyses a requirement of impossible comprehension, which dissolves the appearance of its own perfectibility by showing its insufficient comprehension of human bodies. This redefinition reveals the algorithmic fragility and proneness to cracks that fail precisely "at the task which they have been set: to read the body perfectly" (Magnet 50), suggesting that the ways in which trans bodies are perceived as illegible are set to endanger public and national security, but also the very reliability and accuracy of algorithmic surveillance technologies themselves – such as with this example of the body scanner. The embodiment emerging from the trans body complicates this

encoded binary body template and reorients the algorithmic imaginaries of the body itself. This liminality of trans data lives means that they are simultaneously misrecognised, while also exceeding the computational bounds of algorithms and the codified idea of the human body.

Similar to the ways in which trans faces reveal further configurations of in/visibility and spatiotemporal dynamics within facial recognition technologies, trans bodies disrupt and unveil the artificiality of the cisgender body as the default body template programmed into these scanners and aesthetically stretch the boundaries of what it means to algorithmically 'know a body'. This trans-aesthetic expansion into what it means to produce knowledge about and render bodies knowledgeable challenges the normatively embedded procedures of which bodies are visually and politically valued alongside the processes through which certain bodies are—without exception or much tactical questioning—synthetically constructed as permissible. The pressing question then is, how might this aesthetic of trans bodies be made productive into altering the desires of making certain bodies known and what it means to algorithmically 'know a body'?

Crucially, as argued by Os Keyes, "if these systems cannot conceptualize that you exist, then you are essentially living in a space that is constantly misgendering you and informing you that you're not real" (cited in Cockerell). Together, the algorithmic technologies brought forward by this article highlight the shared, systematic algorithmic violation of trans bodies and showcase the inherent tension of the liminality embodied by trans data lives through their entanglement with and refusal of binary code. Resistance to these encoded modes of unliveability begins at the exact point of exposing the instability of said categories that trans lives—through the flesh and through data—are dismissed and rejected from due to the binary logics that undergird and effectuate the functionality and operations of algorithmic technologies. The liminality of trans data lives allows for an 'aesthetic trick' of—within in the acts of being positioned as targets for erasure and exclusion—confronting the gaze of the code and slipping through the systems. By attending to this simultaneous reality of trans data lives, it becomes clear how trans lives are parallelly positioned for violent exposure from algorithmic code, yet defy these bounds through a distance to algorithms as a way of living anyway in-between the coded lines.

Conclusion

Despite the global claim of algorithms as revolutionary and with an unprecedented perfectibility to improve human lives delivered by Big tech companies, nation states and far right lobbyist efforts, trans lives effectively locate unexpected, oppositional and unsolvable flaws to the binary code that embrace the fluidity, instability and messiness of gender beyond the colonial binary encoded into the fabric of algorithms; exposing their limitations for computing and comprehending life beyond the default white cisgender human that cement hierarchies of humanness. Fundamentally, algorithmic technologies "echo the imperialist ideologies that

underpinned the development of physiognomy and other scientific projects of classification, meaning that these contemporary technologies have the potential to reify racist, sexist, and cisnormative beliefs and practices" (Scheuerman 2), which vindicate and reinforce global political imaginaries of colonial power intended to strengthen prior practices of exclusion through algorithmic force.

Theorising the aesthetics of trans lives as liminal data lives direct critical attention to the ways in which the appearing uncodeability of transness in binary algorithmic technologies interact, interfere and simmer distractingly in-between the coded lines of algorithmic assemblages that at once produce performative effects of violence and disruption located at the very trans bodies that algorithms cannot comprehend. This redirected attention disrupts not only popular narratives of algorithms as hegemonic and neutral, but advances queer and trans scholarship on glitches and errors to consider the liminality of trans data lives as they reveal crucial cracks, faults and flaws in the systems that can be utilised strategically to resist modes of algorithmic violence through establishing distance while in proximity from the lived experiences of uncodeability by design. It is this trap that trans people find themselves in and inhabit as a liminal space, where they refuse, trouble, and distort algorithmic infrastructures. By doing so, transness, as digital flesh, embodies a lived contrast and differentiating relationship to the algorithmic rendering of life by occupying a spatiotemporal position at both sides of the threshold of algorithmic code; cutting over, falling through, and obscuring the binary flows of code and confusing their anticipated technical outcomes. These errors generate an intricate relationship between trans bodies and algorithms - one perpetually in proximity, but always at a distance.

Situated at this contemporary inception, the questions for future research become, which imaginaries, thresholds, distances and embodied forms of resistance can the digital fleshiness of trans bodies and their lives as inherently situated between the (im)possible, between (in)visibility, (un)codeability and (un)liveability unveil and produce for curating fugitive procedures and operations against algorithmic violence and subverting the binary gaze of life? How can the potential of trans data lives be utilised to envision and engineer trans and gender affirming algorithmic technologies and imaginaries that do not limit, but rather multiply the lived realities outside of binary restrictions and technical confinements of current sociopolitical systems? Looking into the digital future, how can exploring and speculating with the aesthetics facets of the sociotechnical uncodeability and liminality of trans data lives work as a critical practice towards building and achieving algorithmic justice? As this article grabbles with the possibility of creating distance to algorithmic technologies, while simultaneously always already being entangled with and existing in proximity to them, this calls for future interventions looking at how this tensional space embedded in the liminality of trans data lives can be made productive from the situated and embodied perspectives of trans lives themselves against algorithmic technologies.

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Biography

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Choreographing Proximity Choreographic Tools For Exploring Intimacy In Digital Platforms

Daria Iuriichuk

Abstract

This article explores how choreography can serve as a critical framework for analysing and intervening in the affective economies of digital platforms. Building on André Lepecki's notion of choreography as a "technique designed to capture actions," it is examined as a medium that abstracts movement into data, enabling further technical or creative processes. Drawing on theories from dance studies, media theory, and affect theory, this article examines choreography's capacity to expose, modulate, and reconfigure proximity and distance. It explores how affect, gaze, and movement are governed, simulated, and potentially subverted within platform cultures. The argument is grounded in case studies ranging from Mette Ingvartsen's performance 50/50 to Candela Capitán's SOLAS. These examples illuminate how bodies and affects are choreographed not only on stage but within digital architectures, offering tools to think against the commodification of intimacy.

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Introduction

Imagine scrolling through your Instagram feed and stumbling upon a girl: her face fills the screen, she seems to be impossibly close. She holds your gaze, maintaining eye contact as if she sees you. Her smile is disarming. You notice her cute cheek dimples and feel hypnotised. It draws you in and makes you feel seen, as if this gaze is meant only for you. She creates a sense of presence that is almost uncomfortably intimate, leveraging the illusion of proximity to connect with her thousands of followers. On platforms like Instagram or OnlyFans, the *production of proximity* becomes a conspicuous tool for creating intimacy, often blurring boundaries between public performance and private connection.

Emerging technologies are multiplying the ways in which proximity is produced, often by simulating emotional presence and connection. Services for video conferences, such as NVIDIA Maxine, offer real-time gaze correction and facial expression adjustments to create a sense of attentiveness. Deepfake tools like DeepFaceLab and Wav2Lip generate hyperrealistic facial expressions and precise lip-syncing, making pre-recorded or altered content appear convincingly authentic. Most recently, video generation models such as OpenAI's Sora can produce lifelike gestures, facial cues, and subtle emotional inflexions, further blurring the line between scripted performance and spontaneous, affective interaction.

Intimacy is not just present on the Web – it is thoroughly constructed through strategic self-presentation, continuous engagement, and the creation of affective bonds that simulate closeness. It becomes particularly evident in affective platforms with erotic content, where proximity is not just simulated but commodified. For instance, an OnlyFans content creator may establish a sense of intimacy by creating a digital morning-after scene to evoke a sense of proximity, ultimately directing the viewer towards engagement with monetised content. However, as Kaufman, Gesselman and Bennett-Brown observe in their analysis of cam sites, clients often experience this affective labour as 'real' (2). This closeness is perceived by viewers as "authentic," even though it is produced through a specific choreography of affect, gesture, and gaze that aligns with platform economies.

The production of proximity has been increasingly instrumentalised not only for commodification but also for the circulation of reactionary political affects. With the rise of AI-driven technologies, affective interfaces now simulate intimacy with growing precision, intensifying the manipulation of attention and further entrenching users within ideologically charged affective economies.

In *The Digital Subject: People as Data as Persons,* Olga Goriunova coins the term *digital subject* to describe new forms of subject construction constituted through data, including social media profiles, browsing history, and mobile phone positioning records, as well as biometric and facial recognition inputs. This concept captures the entanglement of biological characteristics, legal frameworks and performed

identities. In the context of digital intimacy, shaped both by bloggers and by technologies such as gaze correction, face tracking, deepfakes, and AI-generated videos, the digital subject is formed using data abstracted from the body, including eye movements, smiles, voice, and posture. These emotional gestures are transformed into patterns that can be manipulated, animated, and replayed. According to Goriunova, the idea of distance is central to understanding the digital subject, as it possesses ontological instability, occupying neither the space of lived human experience nor its representation but exists as a *distance between the two* (5). In her article, Goriunova also warns against assuming an equivalence between "digital subjects and the humans, entities, and processes they are connected to" (5). She argues that distance becomes an urgent political issue when digital subjects are "constructed not only to sell products but also to imprison, medically treat, or discriminate against individuals" (7).

To respond to Goriunova's political call to confront the erasure of distance, I propose to explore the *distance* and the *production of proximity* through the seemingly marginal yet conceptually rich lens of choreography. Here, choreography is understood not merely as dance movement but as a conceptual tradition that engages with the creative and critical potentialities of algorithmic thinking. Building on André Lepecki's notion of choreography as a "technique designed to capture actions" (Lepecki "Choreography and Pornography"), I examine it as a medium that abstracts movement into data. Viewing choreography as a framework for the production of proximity prompts us to consider how algorithmic structures are embodied and practised, echoing Andrew Hewitt's concept of choreography as embodied ideologies, which are ways in which social order is enacted physically (Hewitt 11). Through this lens, I explore how choreographic thinking might offer not only tools for critical engagement with the mechanisms of proximity production, so central to platform culture, but also strategies for repurposing them, enabling the digital body to become something more than a local embodiment of ideology (Massumi 3).

In this text, I will focus on two perspectives on choreography: first, as a historical technology for representing societal hierarchies by managing affects, distance, and proximity through steps, posture, and collective movement patterns; and second, as a set of strategies developed in contemporary dance to address the abstraction of movement into data, to reframe the choreographic score, and to critically engage with affect. In addressing the concept of affect, I follow the tradition of affect theory articulated by Deleuze and Guattari and developed further by Brian Massumi, as well as its elaboration within choreographic discourse by Bojana Cvejić.

Choreography As An Approach

Long before algorithms learned to track our eye contact or simulate our smiles, there was already a technology for scripting bodies – choreography – organising limbs, timing gestures, and composing presence in highly coded ways. Flourished as

a Louis XIV court practice of political control, choreography, a tool of writing down movement, could also be observed as a "technique designed to capture actions" (Lepecki, “Choreography and Pornography”), a medium that abstracts movement into data, enabling further technical or creative processes. By abstracting bodily movement into data, choreography transforms it into systems of control and knowledge production, shaping behaviour by training bodies to perform socially acceptable identities.

In one of the early dance manuals, *Orchésographie: A Treatise in the Form of a Dialogue. Whereby All May Easily Learn and Practice the Honourable Exercise of Dancing* (1589), Thoinot Arbeau introduces an *orchésographie* (*where orchésis – dance)* as a written form of dance knowledge transmission. The manual unfolds as a dialogue between a young lawyer, Capriol, and Arbeau himself, offering detailed descriptions of 16th-century and earlier dance forms. Through this textual format, dance is transformed into codified knowledge. The written score abstracts movement from the living body, creating a distance between embodied performance and its data-like representation.

As André Lepecki argues, with the invention of its written form, dance possesses a spectral dimension: by being written down as choreography, it becomes a medium that conjures the presence of an absent dance master (Lepecki, “Exhausting Dance” 28). In this sense, the choreographic score does not just preserve movement –it animates bodies across time, allowing historical authority and disciplinary regimes to speak through the dancer. "In Orchesographie, a young lawyer returns from Paris to Langres to visit his old master of “computation (...) Capriol asks for dance lessons to attain what Erving Goffman called a socially acceptable “performance of the self” – a performance that would give the young lawyer admission into social theatrics, into society’s normative heterosexual dancing" (25). During the Baroque era, choreography evolved further, functioning as a tool of propaganda (Maravall). By codifying steps, postures, and sequences, dance emphasised symmetry and control, aligning the disciplined body with a higher spiritual or intellectual order. As Susan McClary, referring to Robert Isherwood stressed, Louis XIV used dance as a source of political control “to regulate – indeed, to synchronise – the bodies and behaviours of his courtiers” (McClary 89).

Similarly, digital data is aggregated today to mobilise bodies within a fluid logic of surveillance capitalism. In this sense, *choreography and algorithms both function as technologies of subject formation,* conditioning our behaviours and interactions in increasingly automated ways.

Lepecki’s idea that choreography “socialises with the spectral” helps us think through how the digital subject is haunted by the idea of presence, even when the body is absent, the subject must appear available, coherent, and even emotionally attuned. Through this lens, we can think of algorithmic media as staging choreographies of presence–Zoom backgrounds, auto-eye contact tools, and real-

time filters all simulate spontaneity and emotional availability, much like how baroque dancers rehearsed "natural" grace.

Dance Strategies

By the 20th century, modern and later contemporary dance sought to liberate movement and the body from the codifying constraints of choreography understood as a technology that produces societal hierarchies by regulating affect, distance, and proximity through steps, posture, and collective movement patterns. From Isadora Duncan's praise of free movement to postmodern dance's passion for improvisation, choreographers have historically resisted the rigid legacy of court dance and ballet in favour of spontaneous self-expression and embodied freedom. In problematizing the very notion of choreography, they developed diverse strategies for subverting established structures, often creating new modes of emotional connection with the audience. These strategies offer some insights into the production of proximity and its affective charge, making them particularly relevant in the context of today's digitally mediated cultures.

In *Choreographing Problems*, Bojana Cvejić outlines a compelling genealogy of how dance has theorised sensation, emotion, and affect, from the emotionalism of the modern dance tradition, where performing and perceiving movement are inherently tied to emotional expression and kinesthetic empathy, to more critical and experimental engagements with affect in contemporary choreographic practices. The idea of the movement as an emotional act of expression of true self, one that binds the spectator to the performance through empathy, was central to the work of iconic choreographer Martha Graham and her critic and advocate John Martin. Their ideas later informed the practice of the *Authentic Movement*, which treated movement as the expression of an inner life. As Cvejić notes, in this tradition, emotional proximity between performer and audience was thought to emerge from "an emotional experience of one's own body and its freedom of movement, a value dance was believed to hold for its viewers" (162). However, postmodern dance explicitly broke with this conception, seeking to dissociate choreography from dance by disrupting what Cvejić calls "the onto-historically foundational bind between the body and movement" (17). Here, movement is no longer the natural expression of interiority, but an object in its own right.

In the clash between two ideas about movement – the one is that movement is an expression of the true self, and the other is that movement is not a reflection of interiority but its own thing, a new approach has emerged. In her performance *50/50*, a Danish contemporary choreographer, Mette Ingvartsen investigates the composition of affect, positing the question of whether affect can be deliberately constructed and artistically produced. In *50/50*, she works with an interplay of movement and sound borrowed from semiotically distinct expressive forms and clashes them into a specific affective object. Thus, in one of the scenes, Ingvartsen rhythmically moves her buttocks mirroring a drumroll with extreme precision, to create the illusion that the drummer is playing directly on her body. As the rhythm

accelerates, the movement becomes a visceral vibration, and the pulsating body dissolves the distinction between stimulus and response. Motion and sound appear to merge, or even reverse roles. This synesthetic fusion intensifies the experience: sound is visually amplified, and movement becomes aurally charged (Cvejić 174-175). Ingvartsen's experiments with affect in 50/50 parallel Brian Massumi's analysis of Ronald Reagan, who, as Massumi argues, generated ideological effects through non-ideological, but affective means. In both cases, affect is not tied to explicit content but operates through a kind of abstractive suspense – multiple sensorial or expressive registers resonating in parallel to produce an intensity that exceeds rational articulation (Massumi 41).

In her reading of Ingvartsen's performance, Cvejić approaches affects as "synesthetic events that exist autonomously, neither only in the body of the performer, nor only in the perception of the attender" (194). Drawing on genealogy from Spinoza to Deleuze and Guattari, Cvejić conceptualises affect as impersonal – detached from the subject's interiority (168). She also shows affects can be composed by choreographing sensorial materials and appropriated styles of performance (rock concert, opera, pantomime). For the analysis of the production of proximity, I find Bojana Cvejić's argument for a constructivist composition of affect particularly fruitful. It offers a valuable lens for speculating on the affective techniques employed by platforms. This approach allows us to interrogate how affect is composed and how bodies, movement and choreography become integral to this construction.

In Mette Ingvartsen's work, movement is treated not as a vehicle for personal expression; but rather as a system of discrete units – gestures, postures, rhythms – that can be abstracted, recomposed, algorithmicised and choreographed to generate affect. This resembles the logics of services for video conferencing, deepfake tools, and AI video generation technologies, in which gestures, facial expressions, and vocal inflections – are broken down into measurable variables, recombining them to create realistic simulations of proximity. Crucially, however, Ingvartsen's choreography does not replicate this logic in order to reinforce ideological capture; instead, it seeks to expose and reconfigure the affective mechanisms underlying such processes. By rendering the dynamics of distance and proximity manipulable and visible, such practices of choreographing affect might serve as a framework for critically examining how platforms shape attention, behavior, and embodied interaction. Through abstraction, recomposition, and the deliberate misuse of platform grammars, these choreographic strategies open space for friction, distance, and critical reflection—providing potential counter-strategies within systems designed for affective capture and behavioral control.

While Ingvartsen's work demonstrates how choreographic strategies can be used to critically and creatively compose affect, sparking the imagination for its potential applications for platform cultures, Candela Capitán, another contemporary choreographer, engages with digital intimacy, bringing us back to the notion of distance as articulated by Goriunova.

In SOLAS digital intimacy production techniques are explored from a detached, bird's-eye perspective. On stage, five performers in tight pink suits each perform an erotic solo in front of their laptops, evoking the setup of webcam models. Simultaneously, the solos are broadcast live to an audience via the Chaturbate platform. Capitán reveals the gap between the digital subject and the labour that sustains it, making this distance strikingly palpable. By exposing the fractured connections and isolating conditions of digital performance, SOLAS lays bare the mechanisms through which intimacy is manufactured, commodified, and consumed in virtual spaces. Candela's critical gesture is achieved by revealing living bodies behind digital subjects. By foregrounding the performers' corporeal presence, it insists on the presence of the body as essential for critique in the age of algorithmic mediation.

The performance also invites us to speculate on choreographic interventions within digital platforms. What kinds of artistic strategies might be developed as online practices to reconfigure the digital body so that it becomes more than an embodiment of ideology? How might proximity, attention, and affect be repurposed as aesthetic and political tools for critical engagement and disruption within the platforms?

Thus, choreography becomes not merely a metaphor but a critical method for analysing digital intimacy and the affective architecture of platforms. It can function as a critical lens, a performative practice, and a tactical intervention within platforms and outside them. This choreographic perspective allows us to critically examine the mechanics of digital intimacy and mediated presence while also opening space to imagine interventions into platform architectures themselves.

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Biography

Daria Iuriichuk is a dance artist, researcher, and educator based in Berlin. Her work explores the political dimensions of performativity, infrastructural critique, and body politics. In her most recent research and artistic projects, she explores choreography as a medium that abstracts movement into data, enabling further technical or creative processes. Her works have been presented at the MyWildFlag festival (Stockholm), neue Gesellschaft für bildende Kunst (nGbK, Berlin), Hellerau Europäisches Zentrum der Künste (Dresden), H0 Institut für Metamorphose festival (Zürich), and the Meyerhold Theatre Center (Moscow). She is also a co-founder of *Girls in Scores*, a collaborative project with Polina Fenko, focused on artistic research at the intersection of media studies and expanded choreography.

The Computational Approach To Aesthetics: Value Alignment And The Political Economy Of Attention In Museums And Text-To-Image Generator Stable Diffusion

Sami P. Itävuori

Abstract

Whilst research into cultural value and digital technologies is nascent in art museums, neural media technologies like generative AI pose new methodological and theoretical challenges. Looking at the case of the Tate Gallery and the dataset LAION 5B used to train the text-to-image Stable Diffusion model, the article highlights the long running challenges of studying digital media from a museum perspective. Reflecting on previous uses of AI in the museum, they propose experiments in dataset research and analysis by which museums can evidence the use of their images in the training of Stable Diffusion. But these experiments also aim to develop ways in which changes in cultural value can be analysed and theorised when art collection photographs get operationalised in LAION 5B. Sketching the first steps of an epistemological analysis of image aesthetic assessment and aesthetic predictors from the perspective of museum values and aesthetics, I call for a more thorough engagement with the discourses and practices on art developed in computer sciences so that new collective and connected imaginaries of culture and advanced technology may be constructed.

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Introduction

Art museums have tended to frame their understanding of AI as an add-on to existing museum activities and a tool to fulfil legacy missions like conservation, collection activation, museum learning or productivity gains. This utilitarian approach has clear benefits in supporting various aspects of museum work. But focussing too closely on this dimension disregards not only the heterogeneous systems that fall under the umbrella term 'AI' but also the economic, social and cultural forces shaping it. Whilst museums like Tate have taken small steps in this direction with projects such as Transforming Collections, a more focused discussion of images and AI, aesthetics and technology, values and automation can help address "the yawning gap" (Rutherford 60) that is said to separate the mindsets of museum practitioners and computer engineers.

Research into this area is crucial to fully understand the technological ecosystem that art institutions such as the Tate gallery participate in and to inform their public programming and curatorial practices, considering the emerging digital politics of generative AI systems. Museums also raise significant problems about the formation of aesthetic and cultural value around aesthetics and visuality as they get conceived in the case of Stable Diffusion, a popular generative AI model and digital image generation service that is widely used in commercial systems such as Midjourney or DreamStudio.

The aim of this article is to demonstrate the use of images issued from the Tate's collection in the training dataset of Stable Diffusion (SD) and briefly explain how this influences the production of images generated by this model. Once this link has been established, I will argue that divergent sets of values regarding art and its purpose emerge from the computer sciences literature in what I tentatively propose to call a *computational approach to aesthetics*. In relation to SD, this approach is not only a set of computational image-processing techniques that radically change the contextual use and nature of images harvested from the net. Instead, these generative techniques also produce and interpellate subjects as objects of scientific research and automation, as well as producers and consumers of data. Not only does SD rely on the automation of creative and cognitive tasks previously performed by humans, but its operations are predicated on prior modes of attention capture and commodification that underlie current digital platform economies (Nixon). Before undertaking this critical discussion, I will shortly survey existing approaches that have been adopted to generative AI within the museum sector in what I think are archetypal examples.

AI in the Museum

AI's areas of application in the museum are numerous but I will be focusing on projects involving digital collections of art and how AI has been used to open the collection or create new ways of searching it.

Custom AI models such as the *Digital Curator* (2022) have been built to retrieve patterns within large amounts of collection data from a consortium of Central European art museums. The browser-based platform enables users to see the statistical occurrence of objects such as "melons" or "monsters" by period, geography or artistic movement. It opens the metadata of collection images to visitors whilst also incentivizing them to discover lesser-known artefacts.

This idea of the discovery of new images is also present in other projects. The Rijksmuseum's *Art Explorer* (2024) invites users to write prompts regarding their current emotional state, their likes and dislikes into a browser-ran generative pre-trained transformer model (GPT) that then retrieves assets from the digitised collection. The interface aims to create a more intimate and affective approach to the collection, surfacing works the user wouldn't have intuitively searched for themselves.

On the other end of the spectrum in the context of Helsinki Biennale, the *Newly Formed City* (2023) project deployed AI to curate an online exhibition where artworks from the Helsinki Art Museum's collection are located on a web mapping platform of the city. The artworks are algorithmically selected, placed on a digital map and the digital images of paintings or sculptures get inserted into the panoramic digital street views of these locations. This model applies a filter to the surrounding landscape, like augmented reality apps. The filter transposes the artwork's formal qualities such as colour, texture, materials, shapes onto the digital landscape, providing a new experience of the city to local inhabitants and visitors alike.

Many more examples have been recorded in recent literature on the topic of museums and AI more generally. In 2021 Soufian Audry highlighted the emergence of AI as a popular topic for museum exhibitions, surveying eight international exhibitions on the topic (4).

Similarly, the edited volume *AI in Museums* (ed. Thiel and Bernhardt) present the various applications of AI in all areas of museum work from collection management to education via marketing and curation. Hufschmidt surveys a hundred and twenty-two such projects taking place between 2014 and 2019, with most of them focusing on enhancing visitor experience of the collection with audio guides and collection search-tools (133). Most recently, the 2025 MuseumNext's *MuseumAI Summit* brought together international museum professionals and creative technologists with a focus on collection activation and visitor-data analysis using AI.

Museums are actively adopting AI-powered software to analyse or 'activate' the vast amount of data they hold about objects in their collections. But it is very much of 'adoption' that I am talking about here, insofar the techniques of artificial intelligence are adopted from outside the museum by either using off-the shelf models or commissioning creative technologists to do it for them. There is nothing

inherently wrong about these approaches given the technical complexity of these models and the significant skills and investment custom models require. But this nevertheless isolates the museum and the development of AI products from each other as separate fields of life, activity and reflection, with little to no common ground for dialogue or interrogation.

This separation is not without consequences and contributes to a "yawning gap" between the concepts, mentalities and practices of museums and of developers behind AI systems (Rutherford 60). It reinforces the 'black box' narrative that hinders a head-on engagement with the 'AI tech stack' (Ivanova et al.) as too complex or too big for scrutiny by researchers outside computer sciences (Bunz 26; Gogalth 175). Whilst issues of bias, privacy or copyright are already being discussed in the sector, art museums are largely lacking means to stir a critical reflection on the inherently social and economic dimensions of AI technologies, their impact on human lives and the role of the museum collection in an era of neural media. Considering AI in the singular mystifies the variety of techniques that are deployed to analyse and synthesise large amounts of data, and the values that guide these deployments. It leads the conversation away from the real problem: the human use of these technologies with and on other humans. The digital politics of museum collections in an information society, the process of defining the values that guide their existence and societal role, thus need to be revised considering emerging AI powered neural medias (Fuchsgruber; Allado-McDowell)

This idea of the museum having societal agency builds on the contemporary articulation of its role as not only sites of collection preservation and exhibition, but also spaces of experience centring the visitor, their needs and agency in what has been called the post-museum (Hooper-Greenhill 22). With roots in the nineteen-nineties new museology, this re-centring of the visitor and the civic role of the museum in the UK had also been pushed since the two-thousands by the focus on culture's "use-value" in securing government funding (McPherson 46). This reformatted the museum as a site of pedagogy and entertainment, to both address the growing competition of new media and experience economies for public attention, as well as produce measurable impact metrics to justify public funding of these institutions (Scott, Dodd and Sandell 9). Whilst this policy orientation has pushed a new industry of quantitative research about public impact and outreach, the museum object remains conceptualised as holding an 'intrinsic' value that ties personal experience to collective meaning making. In this definition, the artefact and museum expertise (organisational, pedagogic and curatorial) mediate the representation of a social group to a symbolic world linking the past to the present as well as a potential future, endowing heritage institutions with a unique societal role (Crossick and Kaszynska 16).

Whilst this haptic dimension of the museum's symbolic function is a constant in the justification of museum collections and investment in preservation work, this intrinsic value of the object has been complicated by digital technologies that create distance between the audience, the space and the object, but also new

distributed modes of communication about images, stories and experiences of artworks. The meanings and contexts of artworks have been further fragmented in digital networks for instance. These networks multiply the sites and voices that mediate the reception and discussion of artefacts, and trouble the institution's curatorial authority, which often relies on one-way broadcasting modes of online communication (Styles; Zouli). Online media landscapes complicate not only the measurement, but the very conception of cultural value, as the parameters of art and its images' experience change (Dewdney and Walsh 15). A trend that only seems to be accentuated by the creation of machines capable of identifying, evaluating and recreating images of art and whose values seem to conflict with values associated with artistic authenticity, creative labour or the disinterestedness of aesthetic experiences. There seems to be an inherent problem with the 'alignment' of values between institutional perceptions of art in museum collections and emerging generative AI, which build on previous tensions from preceding digital medias like television or the internet.[1]

So, what is the transformation of cultural value that has taken place with the advent of systems that can produce images of art with natural language text prompts? And what does this say about the emerging relation of art museums to these models?

To answer this question, I will now evidence the link between Tate gallery and the text-to-image generative AI model Stable Diffusion.

Diffused Images

i. the digital photograph of artworks

The Tate gallery is a national museum in the UK that consists of four geographical sites across London, St. Ives and Liverpool. To use language from its previous media strategies in the early parts of the two-thousands, Tate's website was conceived as the "fifth site" of Tate with its own programme and dedicated visitor resources (both curatorial experiment and "brochure ware") (Rellie). The history of this "fifth site" can be traced back to the British Art Information Project (BAIP) of the late 1990s, which promoted the large-scale digitization of collections and archives across national portfolio institutions in the UK. Whilst digital photography of collections started in the early nineties, the launch of the Tate's website in 1997 is directly tied to this digitization project in the build-up to the opening of the new Tate Britain wing as part of the museum's Millenium Project.

The current iteration of the collection website *Art and Artists* displays more than seventy-seven thousand collection photographs ranging from film stills to paintings via artist sketches and installations. Most photographs are available under creative commons licenses or can be licensed for a fee from Tate. Guiding the release of these images online was the idea of supporting access to the collection, regardless of geographical and temporal boundaries. It supported the fundamental targets of this national museums' mission statement to promote the appreciation and

understanding of British and international art to the public in addition to the preservation of collections in digital form. Adjacent to these aims, the net was also conceived as a site of free information circulation, as well as an expanded marketplace where virtual visits would translate into 'real' footfall and income in the gallery (ticketing, catering, gift shop).

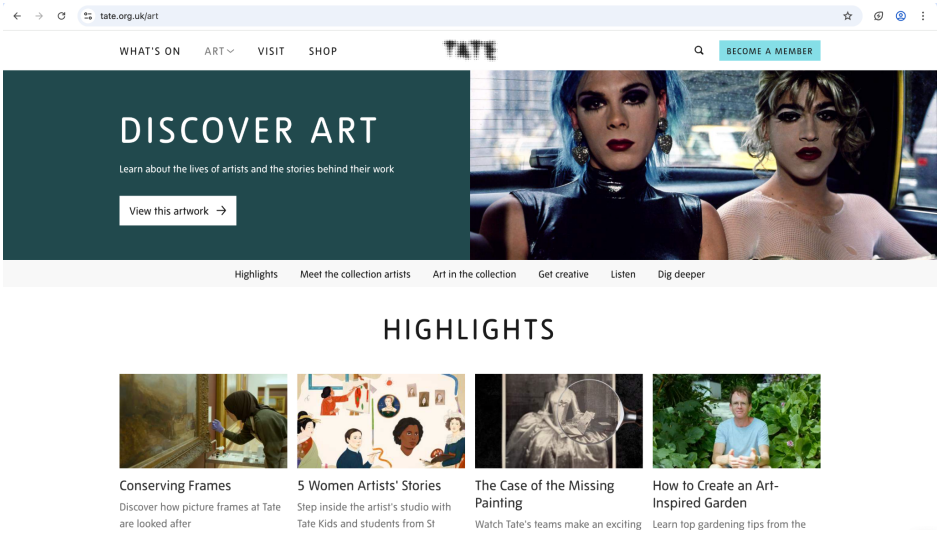


Figure 1: Screenshot of the Art and Artists Section of the Tate Website. https://www.tate.org.uk/art (accessed 5. June 2025).

Digital media then becomes a ground where disparate, overlapping values get negotiated: tools to support the cultural and civic mission of the museum to promote its art collection as valuable in and for itself. Tools supporting governmental goals of societal regeneration and education. But also, tools to support the emerging entrepreneurial business model of the museum following public funding cuts (Hughes 9). The production of digital photographs of artworks in museums is thus guided and animated by these divergent and concurrent values that co-exist when being operated internally in organisational databases and circulated on the public facing website.

The online circulation of the artwork's digital image leads to a change in its nature. Whilst the physical artwork remains mediated and 'framed' by the institutional discourse and values, the digital photograph of the artwork once online gets appropriated, reused and maybe misused in a multitude of ways by online users. The circulation of digital images means that any image posted online undergoes endless copying, compression, editing and pasting that impact the image technically (degraded resolution, dimensions, watermarks, captions), and culturally by decontextualising the image (Steyerl, "In Defence of the Poor Image"). Once online, the museum relinquishes a degree of control over its reception and uses, including its reproduction, derivations or commodification. This network of online circulation is the ground on which the museum meets new AI systems such as Stable Diffusion, which I will briefly present now.

ii. the images of Stable Diffusion

Stable Diffusion (SD) is a popular generative AI system developed by the Ludwig-Maximilian University of Munich and the British private company Stability AI. The system can generate images from natural language prompts. SD operates on a diffusion model (DM), which is a process of deep learning (Rombach et al). In training a DM, a set of algorithms called a neural network is iteratively improving its capacity to remember the content of 'images' and to reconstitute them from statistical noise. How does it do this? The DM relies on a process of noising – where the data in input images is increasingly deteriorated by inserting Gaussian noise. The aim of the model is to then denoise the degraded image by following successive steps of reconstructing the target image (or 're-membering', putting parts or pixels back into their place). The noisy starting point has some structured clusters of pixels remaining in it, which the model builds on to draw the outlines of its target image.

How is this prediction process guided? DM utilises a pre-trained machine vision model called the Contrastive Language-Image Pre-training (CLIP), which ties textual descriptors to image data within a latent space (Radford et al). A latent space is a high-dimensional statistical space where image data and text data are converted into machine-readable numerical tokens. These tokens act almost like coordinates on a 3D map and each token's position is determined by the statistical frequency of their co-occurrence in the training data. This is essentially the model's 'attention' to the context-specificity of certain words and figures, and how it can differentiate the 'apple' in a tree from 'Apple' computers. This is also how the model can be steered to produce new images that may not exist in its dataset by writing text-prompts. The prompts connect different areas of the latent space and enable a hybridisation of the data. The model aims to guess how these images would look like and rely on the successive feedback of humans but also automated models to either validate or reject its predictions and to re-adjust its process. The illustration in Figure 2 aims to illustrate the prediction process of SD, denoising a seed image in 4 stages for the prompt "photorealist image of an apple-computer (1 steps, 4 steps, 5 steps, 15 steps).

Figure 2: four denoising steps on Stable Diffusion (v. 2023) ran on ComfyUI. https://huggingface.co/stabilityai/stable-diffusion-xl-base-1.0/tree/main

In this broad summary, I hope it is clear that generative models like SD rely on the association of natural language descriptors to image data. Also essential is the

compression of this data into a new tokenised form, distributed in a multidimensional vector space according to the statistical frequency of their occurrence. By using language and mathematical abstraction, a semiotic-visual syntax and vocabulary is developed. The model is seemingly able to 'know' what an apple or a computer looks like and thus be able to 'predict' what an Apple computer or image an 'apple-computer' must look like, based on its 'memory' and attention to context in the latent space.

It is inevitable that the popularity of this diffusion model will be supplanted by another model in the years to come, especially given the speed at which research is moving in the current AI arms-race (Aschenbrenner). I would still argue that the fundamental representational logic of generative image-making is unlikely to change. This logic relies on the collecting, modelling and articulation of images with language and mathematics to make them machine-readable. Whilst in contemporary art theory semiotics had been mostly evacuated from the visual field, particularly with the 'autonomy' thesis of the artwork and the challenged 'indexicality' of photographic images, the concepts behind diffusion models take a diametrically opposite approach. In diffusion models, images are framed as solid representations of a homogeneous reality that is describable by language and statistics. This correspondence of images to reality in DM raises a series of broader epistemological questions about images of art, their treatment in generative AI research and the underlying aesthetic culture of this technology. On this basis it is enlightening to look at the ways images are pre-processed for models like Stable Diffusion in their visual memory bank, namely the dataset LAION 5B.

iii. Images of LAION

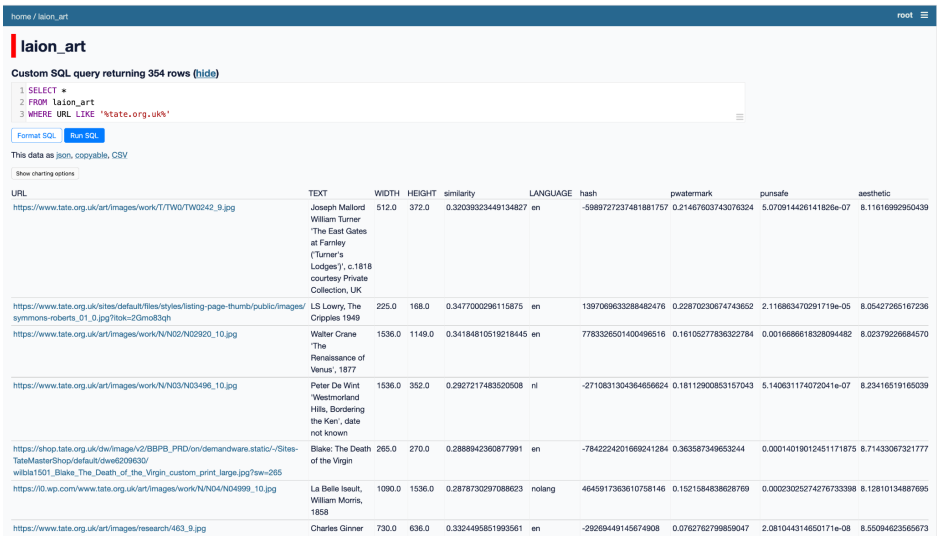
Here the online circulation of collection images ties into the pipeline of machine learning training of SD. The training process requires large amounts of image-text data, which in the case of SD were harvested from the internet using a bot called a crawler. Whilst the initial crawling process of downloading large swaths of the internet was done by a not-for-profit organisation called Common Crawl, it was another not-for-profit, LAION which with the support of Stability.AI and the LMU curated and compiled the LAION dataset (Schuhmann et al). Currently LAION-5B is a five billion strong dataset with images and text harvested from the internet. It contains both the 'best' and the 'worst' of the internet, from amateur websites to stock photos, photographs posted on Flickr or digitised artworks. In my research at Tate, I chose to work on diffusion models like SD because the training dataset LAION is available open-access and thus searchable. Until recently LAION-5B was available for free download on Hugging Face but in 2024 significant amounts of harmful, abusive and illegal content was discovered, forcing its removal from circulation until a full audit is completed (Thiel 7). The sheer amount of data contained in LAION means that having the images checked by humans was considered impractical, too lengthy and too expensive. For these reasons the reviewing process was automated with an object recognition system. The system was tasked to rate the 'safety' of images depending on their likelihood to have

harmful content or poor image quality. LAION's five billion images had been algorithmically reviewed. The algorithm had failed on several occasions.

A smaller subsection of LAION considered to be safer and of a 'higher aesthetic quality' is still online and available to download. This LAION-Aesthetic subset contains eight-million lines of data. Each item includes certain essential information including the source URL of the images and text.

I coded a simple search tool to identify assets issued from the Tate website. Browser-run search-tools had previously been available for LAION-5B until it had been taken offline. I settled on the use of Datasette, an open-source software that enables the search of datasets using the SQLite relational database model. The software was coded and ran using the cloud-based development environment Github Codespace. I used a free plan and ran the program from my laptop using a 2-core, 8GB RAM, 32GB virtual machine.

Because LAION-5B and LAION-Aesthetic are presented as relational datasets made of columns holding asset metadata, I had the possibility of filtering LAION-Aesthetic by search terms. As each image-text pair was indexed with their source URL, I was able to filter the database for the domain "tate.org.uk" and received 354 results back. The scraped images ranged from works by J. M. William Turner (thirty-two in total), a photograph of the sculpture *Winter Bears* (1998) by Jeff Koons or illustrations by Beatrix Potter. Nine women artists were represented out of a total of 125.


home / laion_art

root

laion_art

Custom SQL query returning 354 rows (hide)

```
SELECT *
FROM laion_art
WHERE URL LIKE '%tate.org.uk%'
```

Format SQL Run SQL

This data as json, copyable, CSV

Show charting options

URL	TEXT	WIDTH	HEIGHT	similarity	LANGUAGE	hash	pwatermark	punsafe	aesthetic
https://www.tate.org.uk/art/images/work/T/TW0/TW0242_9.jpg	Joseph Mallord William Turner 'The East Gates at Farnley ("Turner's Lodges")', c.1818 courtesy Private Collection, UK	512.0	372.0	0.32039323449134827	en	-5989727237481881757	0.21467603743076324	5.070914426141826e-07	8.11616992950439
https://www.tate.org.uk/sites/default/files/styles/listing-page-thumb/public/images/symmons-roberts_01_0.jpg?itok=2Gmo83qh	LS Lowry, The Cripples 1949	225.0	168.0	0.3477000296115875	en	1397069633288482476	0.22870230674743652	2.116863470291719e-05	8.05427265167236
https://www.tate.org.uk/art/images/work/N/N02/N02920_10.jpg	Walter Crane 'The Renaissance of Venus', 1877	1536.0	1149.0	0.3418481051918445	en	7783326501400496516	0.16105277836322784	0.0016686618328094482	8.02379226684570
https://www.tate.org.uk/art/images/work/N/N03/N03496_10.jpg	Peter De Wint 'Westmorland Hills, Bordering the Ken', date not known	1536.0	352.0	0.2927217483520508	nl	-2710831304364656624	0.18112900853157043	5.140631174072041e-07	8.23416519165039
https://shop.tate.org.uk/dw/image/v2/BBPB_PRD/on/demandware.static/-/Sites-TateMasterShop/default/dwe6209630/wilbla1501_Blake_The_Death_of_the_Virgin_custom_print_large.jpg?sw=265	Blake: The Death of the Virgin	265.0	270.0	0.2888942360877991	en	-7842224201669241284	0.363587349653244	0.0001401901245117187 5	8.71433067321777
https://i0.wp.com/www.tate.org.uk/art/images/work/N/N04/N04999_10.jpg	La Belle Iseult, William Morris, 1858	1090.0	1536.0	0.2878730297088623	nolang	4645917363610758146	0.1521584838628769	0.0002302527427673339 8	8.12810134887695
https://www.tate.org.uk/art/images/research/463_9.jpg	Charles Ginner	730.0	636.0	0.3324495851993561	en	-2926944914567490 8	0.0762762799859047	2.081044314650171e-08	8.55094623565673

Figure 3: Searching for URLs matching "tate.org.uk" on LAION Aesthetic using Datasette.

Fourteen works were from the 1700s,147 from the 1800s, 132 works from the 1900s. The rest of the images did not contain a date in their text data. All images, to the exception of *Winter Bears,* were photographs of two-dimensional paintings. These figures largely reflect the make-up of Tate's collections. For instance, the Tate holds 37,000 works and sketches by William Turner, the majority of which has been digitised.

This selection of images illustrates a data bias towards representing works from the art historical canon. The type of images present in databases like LAION are an essential part of the conversation on the biases of AI systems, which has been the subject of significant attention in critical AI scholarship and computer sciences (Ferrara 2). This bias is also recognised by the developers of SD: "deep learning modules tend to reproduce or exacerbate biases that are already present in the data" (Rombach et al. 9). But saying that the bias lies "already" in the data seems to ignore biases that occur when programmers process, mediate and operationalise the collected data (Offert and Bell 1133). By this I mean that LAION is not just made up of raw data collected from the wild. Instead, a series of human decisions based on cultural and technical rationales determine what data gets used, how and why. For this reason, models like SD don't generate new media just out of raw data but are deeply informed by decisions underlying the collection of data, human interpretation of this data and the aims they want to achieve with it. The bias is already in the human process of capturing the world as information in what could be called the 'capta' (Drucker 2).

Figure 4: Image of Apples in LAION Aesthetic. Described as 'apples'. Aesthetic Score 818764114379828. Source: Bird Feeder Expert website, https://birdfeederexpert.com/wp-content/uploads/2020/12/orchard-1872997_640.jpg

Looking closer at other categories of the dataset the column "aesthetic" stands out. "Aesthetic" denotes the aesthetic score attributed to each image on a sliding scale of zero to ten to measure its aesthetic quality. This quality score is a prediction of the image's appeal to a human viewer and the scores categorise images in LAION from poor to good quality. The images are distributed in 'buckets', that is groupings of images by score. The lowest buckets are poor resolution images with watermarks for example and those which supposedly contain potentially harmful content, whilst the high-quality images are in the buckets 8 to 10. Thus, images are not only described in terms of their content: apples. They are also rated:

this image of apple scores 8.18764114379828. This is very interesting at two levels: how are images evaluated for their aesthetic quality? And why are they evaluated? It is to these questions I turn attention to in the next section.

Image aesthetic assessment: virtual viewers and platform capitalism

Just as they are analysed for perceived harmful content (their safety score), images in LAION are allocated an aesthetic score automatically using a modified version of the CLIP model called an aesthetic predictor (Schuhmann & Beaumont).

Two datasets were used in CLIP aesthetic predictor's pre-training, namely the Simulacra-Aesthetic Captioning (SAC) and the Aesthetic Visual Dataset (AVA). Both datasets are considered benchmarks in machine vision research. Both SAC and AVA contain photographs scored by humans either on online photo competition platforms or by research participants in academic studies. SAC contains ratings for 230 000 AI-generated images (Pressman), whilst AVA contains 250 000 images with ratings and comments collected from the photo-challenge platform DP.Challenge (Murray et al.). Both SAC and AVA were used in training the aesthetic predictor for LAION and thus inform the production of SD's memory and its parameters for evaluating appeal. But how is this appeal defined and determined? Especially since appeal appears at first as a subjective phenomenon.

Underlying the automation of aesthetic rating, lies the scientific effort to theorise and measure the impact of images on humans or elucidate the qualities that make an image appealing. The field of Image Aesthetic Assessment (IAA) takes up this question, with research being undertaken in neurosciences, cognitive psychology, computing and marketing research (Bodini 5). The aim of IAA is to determine what makes an image beautiful and to produce experimental apparatuses, including computational simulations, to support these theories. Surveys of the literature show significant previous efforts to develop an automated assessor based on the formal analysis of artworks. This means hand-crafting arbitrary lists of positive visual qualities, such as composition, subject, rule of thirds, colour combinations, contrast and more (Deng, Loy and Tang, 6). This approach however has lost in popularity since the appearance of deep neural networks that utilise large amounts of data and bypass the need for hand-selected features. The idea that there are a-priori formal qualities underlying the aesthetic appeal of images could be called an objectivist approach to the study of aesthetics (Bodini 4), because it centres the object's qualities as the source of subjective aesthetic experiences. In contrast, current deep learning models aim to mimic the behaviour of human test-groups without prior knowledge of formal qualities that make a visual object appealing. In this subjectivist approach, the impact of an image on its observer takes precedence over formal qualities. In general, this approach aims to measure the impact of individual images on a scale from zero to ten on thousands of human test subjects to produce average scores on a large body of images (Folgerø 19). A deep neural network is then trained to start recognizing patterns of pixels that tend

to be associated with high human scores. These minute pixel patterns that are invisible to the human eye are the building blocks from which the machine perceives appeal, a process that seems completely opposite to human ways of perceiving and receiving images as totalities, rather than minute details. In this paradigm, appeal is not a tangible objective quality but a statistical trend that 'emerges' from the aggregate of human ratings collected 'in the wild'. Echoing Chris Anderson's controversial 2008 claim that big data marks the end of theory in scientific research, current IAA paradigms assert that with enough data, numbers can not only explain but also make aesthetic judgements.

CLIP Aesthetic is built on this subjectivist approach because it has taken most of its scores from online photography websites. One of them, DP.Challenge, is an amateur photography competition run by the Digital Photography Review since 2002. Users are invited to organise thematic competitions and to upload images, which are then anonymously scored and commented. This is the data used for CLIP, but other researchers have proposed to use Reddit's r/photography discussion thread (Nieto et al) or Flickr comments (Soydaner et al) as alternative data sources to train IAA deep learning models. The scores are averaged, but also sometimes require correcting as simple averages tend to neglect sentiment polarity. Polarity, the presence of both very high and low ratings simultaneously, defines an image as 'divisive' because the consensus on its score is considered less reliable. These polarizing images are often removed from the training set because images that have wider appeal are considered 'truer' examples of aesthetic attractiveness since they gather unanimous agreement amongst scorers (Park and Zhang). In a sense CLIP aesthetic predictor is a simulation of user behaviour on platforms like DP.Challenge (as well as the university student test group of AVA, which should be discussed in a separate paper). The aesthetic predictor's aim is to predict reliably the appeal of images, and thus the middle of the road, or 'mean' aesthetic gets prioritised over images that may be divisive or appear unconventional to users. Underlying these aims is to make the model as popular and appealing as possible to a wide user- and consumer-base.

This notion of unreliability is important to discuss the differing value systems that guide SD and museums when they utilise digital images of art. In the training pipeline, the attribution of aesthetic scores dispels the idea of text-image data as something "already" in the data. It is a capta in the sense that the choices underlying the selection of the data, the source of the data and the truth-value assigned to this data are processes of capturing and socially interpreting information within an epistemic and technical framework. In this situation, the aim to produce appealing images with SD means that a way of formalising aesthetic appeal becomes a technical pre-requisite for the synthesis of new images. Images from museum collections are inputs for machine learning and the cognitive processes of human viewers of art also become conceived as inputs. The formalization of appeal requires its definition and in the case of CLIP-aesthetic, appeal is defined as the statistical frequency of pixel patterns unconsciously liked by online photo communities. The user ratings from DP.Challenge then constitute a

'ground truth' of aesthetic appeal (Sluis) in the development of image generators like SD. These ratings are representative of a generalizable human cognitive response to images and can be inferred to make guesses about the appeal of future images. This process is automated in CLIP and finally defines the aesthetics and visual look of images produced by SD. Generative AI then not only translates a further datafication and commodification of images of art, but a datafication of photo-competition participants' cognitive labour when they produce scores and feedback about photographs. In this sense, these systems do not only treat images from national art collections as a means to an end, but they also objectify human interactions with these images, they objectify aesthetics.

Analysed from a visual cultures or aesthetic theory perspective, this approach seems to have several problems. The inductive nature of the reasoning behind the operationalization of this subjectivist approach is problematic because the ratings of amateur hobbyist photographers from North America are confounded with a universalizable notion of aesthetic taste (Sluis and Palmer). This generalization highlights a Western photographic unconsciousness in generative AI but also points to the strong geographic and cultural contingency of the aesthetics promoted by DP.Challenge. This also applies to CLIP aesthetic as it was trained on the same data. It could be said then, that LAION-5B is organised by an automated 'virtual viewer' of these images, a sort of 'virtual connoisseur' with median aesthetic taste, engineered by a mixture of cognitive psychology, neuroaesthetics, statistics and computing. The aesthetic predictor is a form of automata, performing human-like labour of indexing and tagging but its logic seems alien to the affective charge of human reception and interpretation of images. It is built on data about human behaviour, but the predictor's behaviour is very different from the subjective human experience of the world, which seems to change at every iteration, particularly in the case of art. Art is characterised by the difficulty to agree on its definition, but also by a polyvocality in the experience of individual artworks. To just quote a historical example used by Helliwell to discuss value alignment in AGI, the work of Vincent Van Gogh, who was one of the early artists to be used to showcase the power of style-transfer (Gatys et al 5), was derided during his lifetime. His work got positive recognition only decades after his death and points to the fact that the appreciation of artistic styles changes over time and is not a fixed quality, which can be captured at one point and reproduced indefinitely. Theoretically this means then that SD's logic would prohibit the spontaneous emergence of new visual aesthetics that do not conform to existing tastes and preferences. The algorithms then appear as deeply conservative. A reality that stands at odds with the recurrent discourse of progress, democracy and futurity invoked by the developers of these systems.

Conclusion: From Images to Attention Economy

But why is generative image-making the object of so much economic investment, artistic controversy and popular mass adoption? I argue that the techniques behind image generation actually build upon and reinforce the commodification of the

online space. It frames users as customers and any data as resources to be extracted and monetised. The subject being automated in generative AI's virtual viewer reflects this atomised subject of digital platform economies. Online users are being atomised because the platforms on which they build their online existence aim to increasingly isolate them from each other, whilst also extracting as much capital from them in the form of service income or the data they produce (Bridle, 91). This atomisation is further reinforced by these platforms' reliance, from social media to generative platform, on the commodification, capture and retention of the users' time and attention. This race to capture attention lies behind early investment in IAA research so companies could better understand how online consumers act. Internet users are simultaneously interpellated[2] as consumers by algorithmic recommendations within a wider digital marketplace for the provision of goods and services (Terranova 2; Hentschel, Kobs and Hotho 2; Baeza-Yates and Fayyad 132). The political economy of attention in communicative media discussed by Nixon ties the epistemology and techniques of aesthetic appeal in generative AI. It also ties to the wider exploitation of data produced by image-makers, artists, museums and online commentators worldwide.

This process of attention capture, extraction and image generation perpetuate data colonialism's framing of digital networked images as "an 'open' resource for extraction that is somehow 'just there' for capital" (Couldry and Mejias, 337). Previous logics of platform companies such as search engines and social media extend the creation of new consumer needs in the form of mercantile image-generation services online. By extracting digital images, companies selling generative AI services have effectively privatised the internet commons. This lies at the source of controversies with artist lawsuits, scriptwriter strikes and cross-sector concern about the future of creative economies. This process of data pillaging, data colonization and privatization runs parallel and within the scientific project to measure, define and quantify human psychological and cognitive processes to predict the appeal of images, messages and information, both analogue and now synthetic. These techniques of observation, and now generation, continue to inform a symbiotic relationship between emerging modes of visual culture, scientific study of human cognition and emerging modes of economic exploitation (Crary).

This subject atomisation in the digital sphere and reality driven by the aesthetic predictor, the visuality of SD or the marketplace of consumer-oriented platforms stands at odds with the cultural values that are usually associated with artistic heritage and its digital images. Leaving aside the ways in which generative AI models decontextualise all images in their datasets to exploit their representativeness and reduce them to textual descriptors and aesthetic scores, the political economy of these models tends to disenfranchise artists and break the symbolic function of images as a site where meaning, identity and histories are collectively negotiated, preserved or relinquished. As pointed out by Steyerl, the formation of a common-sense of aesthetics relies on the messy, asynchronous and sometimes unresolved reception of images, whose attraction may endure even if their appeal is polarizing (*Medium Hot*, 51). This raises questions about the

possibility of alignment of museum missions with the emerging visuality of generative AI.

Despite their creators' aspiration to "democratize high-resolution image synthesis" (Rombach et al. 1), the inherent political economy of the aesthetics of systems like SD appear more to alienate than to strengthen social bonds and promote creativity. LAION's virtual viewer is not fully the same viewer as the human in the gallery space or the museum website. The instability and free-play associated with aesthetics gets reduced to rational choice-making subjects modelled according to contemporary market logics in aesthetic predictors. Not that market logic is exclusive to the machine, it also animates the values behind museum entrepreneurialism, although these values are constantly negotiated and problematised within the linear progressive values of the institution issued from representational artistic modernity (Dewdney, 5).

By standing at the crossroads of new forms of economic exploitation and emerging forms of human image making, generative AI problematises what it means to look at images, where we look at them and what infrastructures facilitate these modes and techniques of vision. It also raises questions regarding art, images and private property. The process of privatizing data issued from the internet commons reframes all data as a resource to extract and own, thus determining who gets to monetise it, when and how (Bailkin, 14). A similar paradigm of property ownership is characteristic of the way in which museum collections operate, the exhibition being a format that conditions what works can be seen, how and when. But museum websites have gradually disrupted this property paradigm. For instance they have aspired to open the collection's stores and promote the idea of artwork stewardship: namely that artworks in collections are not mere possessions but rather common goods that need to be managed for the good of *all* (Cheng-Davies, 290). Common goods understood as that which benefits the community of users, be it in the promotion of social cohesion, provision of education, improvement of mental health or some other projected value of the artwork. Whilst the common good can be seen to animate museum activities when they release digitised collection data online and partake in public programming, it is less evident in the way that commercial generative AI platforms use images issued from national collections. The opacity of platforms like Midjourney or Dall-E that hides behind convenient user-interfaces, reinforces barriers to a wider understanding of how these systems work and the economic processes that make them possible. This then poses two problems for the humanities and museum institutions: how can cultural institutions reassert a common capacity of anyone to understand and tinker with these systems? What mechanisms or imaginaries need to be formulated, and by whom, to redistribute the benefits of these generative technologies for a common good: creatively, societally, financially?

The task at hand is then to develop strategies, curatorially, organisationally or infrastructurally that promote the reappropriation of data heritage, digital commons and a social ownership of the means of prediction. As a site of heritage, with

buildings, expertise, objects and archives, the museum has the affordance to bring strangers together and maybe turn them into neighbours and community-members (Balshaw). This coming together is essential, not only to share grievances but also a common capacity to deliberate what the common good looks like in a specific situation, place and time. Even if the museum is defined by conflicting values including strong market forces, it also values criticality as a mode of culturally engaging with their histories and collections. This means there are affordances in the current value-system and infrastructure of the museum to engage in this conversation about re-commoning data heritage. As argued at the beginning of this article, the starting point needs to be an understanding of the technology from the perspective of those affected by it: institutions, humans, communities and cultures. As Katz writes: "Explanation of rules is a prerequisite for the democratic control of rules". (22) What this democracy may look like in the museum remains to be imagined and opens a line of research into the techno-aesthetics of generative AI models, not only to inform new museum activities but maybe assert the right and necessity of cultural workers to have a say in the ideas and applications of these fast-moving techniques. It is thus not only the rules guiding the algorithms that need to be explained but also the rules of the emerging political economy of corporations and digital platforms powered and guided by AI that need to be elucidated within visual culture.

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Biography

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