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Automating Visuality
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Automating Visuality: An Introduction

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Intelligent machines and self-learning algorithms increasingly determine not only *who* and *what* we see—what pops up on our screens or bursts into our social media bubbles—but also *how* we see and perceive the world around us. In drawing attention to the "automation of visuality"—by which we mean the automatic sifting, framing, and structuring of everyday life (and death) through machinic forms of vision—we want to examine not only how machines see but what it means when visuality itself, the social fact of seeing, is "curated" by machines.

Today, machines sort and shape what we see in all kinds of seemingly innocuous ways. We are so accustomed to having our personal news feed, social media, or Netflix suggestions served to us automatically that we rarely realize the extent to which our feeds, our "windows" to the world, are custom tailored by unobtrusive algorithms. As the authors of a recently published book, *The Age of AI*, notice: the algorithmic interventions in everyday life have reached a point where "the individual comes to rely, often *instinctively* or *subconsciously*, on software processes to organize and cull necessary and useful information" (Kissinger, Schmidt, and Huttenlocher 105, emphasis added). This observation, for better or worse, extends to "visuality" more broadly as new machinic forms of vision increasingly structure perceptions on a societal scale.

In a sense, the problematic at the heart of this special issue reaches all the way back to Walter Benjamin's celebrated essay "The Work of Art in The Age of Mechanical Reproduction" from 1935. Benjamin's essay, which centered on cinema's social and political implications, has since spawned a

range of critical perspectives on the nature of machinic vision technologies and their impact on society at large. On the following pages we bring together new scholarly approaches to the evolution and current state of automation in the realm of vision technologies with the aim to critically examine the machinic "filtering, decrypting, and pattern recognition" that artist Hito Steyerl rightly identifies as defining traits of our contemporary "post-cinematic" visual culture (47).

The contributions to this issue explore different aspects of the automation of visuality and can be roughly divided into three distinct but interrelated themes: forms of automated surveillance, particularly outside the military nexus (Søilen; Wellendorf et al.); ruptures in the regime of representation and in the correlation between images and their supposed truth content (Uliasz; Lehmuskallio and Meyer); and questions of power inherent to advanced imaging technologies both historically and in the present (Buel; Amin). Much of this new research builds on, extends, and enters into critical conversation with existing scholarship on image technologies and the effects of these technologies on visual culture at large.

A key point of reference for this special issue is Trevor Paglen's idea that the "automation of vision"—including the technology of smart bombs, drone sensors, intelligent surveillance cameras, automatic facial recognition, automatic license plate readers, etc.— challenges entrenched understandings of visual culture as narrowly tied to human interests and human sense-making ("Invisible Pictures"). Following the German filmmaker Harun Farocki, Paglen describes this historical change in terms of a "tectonic shift" in visual culture: a shift from a human-centered ecology of images to a near autonomous feedback loop of machine-readable or "operative" images, of which its aesthetics are not intended.

Farocki's artistic exploration and theorization of what he termed as "operational images" was formulated against the backdrop of US-led warfare in Iraq and based on visual analysis of missile footage from military "targeting" operations ("Phantom Images"). Media theorist Jussi Parikka notes in a forthcoming book on operational images that, although Farocki's founding work on operative images speaks to this military "logic of targeting," his work in this field also encompassed "architectural

modeling, traffic control systems, construction of affective environments such as malls, and other examples that have also paved the way toward current topics of AI culture."

While Paglen and others have also highlighted how forms of operative images are encroaching on various cultural aspects beyond the military realm, much of the discussion about machine vision remains centered on the analysis of overtly militarized aspects of everyday life, most notably contexts of policing, surveillance, and border control. While these remain pertinent contexts to study, recent scholarship has highlighted that operative imaging techniques are increasingly relevant also outside of such para-military contexts (for instance, Aud Sissel Hoel and Frank Lindseth's "Differential Interventions"). This special issue also contributes with new perspectives on these alternative contexts of machine vision.

This partial shift of focus relates to the fact that most AI-assisted imaging systems serve so-called "dual" purposes. The automation of visuality, in other words, cuts across from the military contexts into the less spectacular, quotidian technologies under AI-saturated "surveillance capitalism" where both gendered and racialized hierarchies of power can be evidenced and extended through the visualizing processes of machine vision (Zuboff). As surveillance scholars have pointed out, the automation of surveillance continues, and in some cases even *reinforces*, existing forms of social inequities, racialization, and marginalization (Browne). Faced with new machine vision technologies—automated facial recognition systems are a case in point—scholars are providing more nuanced understandings of surveillance that challenge the traditional dichotomies between target and observer, surveyor and surveillé, enemy and friend.

The figure of the big brother of panoptic surveillance is changing in the context of big data tracking. One important feature of today's imaging systems is that their workings defy the classical military "logic of targeting" so central to the theory of operative images. Today's advanced imaging techniques form part of a contemporary set of data-based targeting procedures that, as the French philosopher Grégoire Chamayou argues in his article "Patterns of Life," not merely tracks and surveils

pre-existing individuals but rather *produces* its subjects across "fields as diverse as policing, military reconnaissance and marketing."

Distinctions between civilian and military realms are disintegrating, calling for analyses that transgress the military-civilian divide and look closer at the ways that surveillance machines operate today. Many users of social media and smart home tech are now surveilled voluntarily. We invite technologies that track, follow, and monitor us into our houses—think about Google Nest or Alexa here—and we carry "smart" devices everywhere in our pockets, on our wrists, or strapped to our bodies. We are physically, affectively, and materially entangled with these new forms of "big data" surveillance. However, this does not necessarily make these technologies less intrusive or violent. On the contrary. But the automated gaze is no longer the piercing camera eye or the all-seeing panopticon but rather a form of sensorial 24/7 surveillance that most of us have gladly welcomed into our domestic life (Andrejevic).

The automated gaze of the robotic vacuum cleaner is a prime example of this type of affective big data surveillance and an excellent entry-point for discussing the automation of visuality in the context of the Western "modern home." These co-bots are often sold under the pretense of helpful household companions, as they can eliminate dirt while you are gone, overcome any surface obstacles, and duly recharge and park themselves after their services. Often these robo-cleaners are equipped with laser based and infra-red cameras and can use artificial intelligence software and deep learning for better mapping (or mopping).

Karen Louise Grova Søilen explores in her contribution, "The Haunting of the Automated Gaze," the robovac-gaze in an aesthetic context analyzing the video installation *Modern Escape* (2018) by the artist duo Hanne Nielsen and Birgit Johnsen. Their artwork exhibits the type of uncanny atmosphere that the non-human cleaner (and observer) creates and how it is able haunt the house with its eerie presence. This haunting triggered by the affective encounter of the robovac makes explicit the military optics and technologies of automatization and its logics of safety, security, and elimination.

The harmless looking vacuum cleaner penetrates our private sphere as a military spy in domestic camouflage.

The authors of "Calm Surveillance in the Leaky Home" (Kassandra Wellendorf, Karen Louise Grova Søilen, and Kristin Veel) also discuss the robotic vacuum cleaner as an example of the automation of visuality. They do not focus on an artwork but rather follow an ethnographic and empirical method, interviewing selected users and owners of a robovac. According to their findings, people who own a robotic vacuum cleaner have mixed affectivities about it. They anthropomorphize it at times as a "benign pet" but also perceive it as a "part-surveillant intruder that sees more than its keeper" (Wellendorf et.al.). In fact, most users highlighted that it is quite a hassle to have such a thing and that the industry's promise of calm co-habitation and harmonious dwelling with it is a myth. Rather robovacs and automated dirt elimination technologies embody a data collection machine with "always on" surveillance that becomes a permanent member of your family.

The robovac is just an example how automated visual technologies can terrorize—or in Søilen's words "haunt"—our private and intimate surroundings. Social media with algorithmic modes of observation, automated generation of deep fake images, facial recognition, and drone imaging – all embodiments of an automated gaze discussed in this theme issue—surveil us often in ways that we do not even know about. They track, map, listen, and observe us in ways that are invisible and inaudible. However, their modes of networked surveillance make us nevertheless complicit with the military origins of these technologies. As Søilen states, referring to the works of Annie Ring, our complicity manifests itself in the "intimate entanglement and shared material histories between the military and consumer technologies." Moreover, our robo-friends can create databases that can be sold to governmental and non-governmental institutions and companies as was the case with the facial recognition company Clearview, which harvested data from social media and sold them to, for example, law enforcement, security firms, and police departments. As these examples of the blurring between the military and the civilian realms suggest, we are confronted with new forms of what drone scholar Caren Kaplan and her colleagues aptly call "everyday militarism" (Kaplan, Kirk, and Lea).

But it is not only the nature of surveillance that changes as it becomes automated, but also the nature of images. Just as it is necessary to think outside the dichotomies of traditional surveillance studies, so too is it crucial to think beyond the dichotomy of "visible and invisible" that still structures contemporary image theory. While it is tempting to think of our automated visual culture in terms of an opposition between visibility and non-visibility, such an approach risks, as Luciana Parisi notes, "to re-inject the truth of representation back into the deep learning of automated networks" (5). The defining feature of visual culture today is not so much that it is "invisible," but rather that the social fact of seeing—or "visuality" in short—passes through opaque proprietary algorithms that perpetuate the structural inequities of capitalist society in coded form.

More important than the accelerated dissemination of discrete images or the overwhelming of the senses by a constant stream of images is the fact that the components of the visual architecture of our shared reality, the image form, are mutating into something else. Notably, this change includes the fact that most images now form a part of mass aggregates, or "image ensembles," that are better understood as statistical entities than as individual fragments of a social totality. "Today," as image theorists Adrian MacKenzie and Anna Munster convincingly argue, "it is the "image *ensemble*—images not simply quantified, but labelled, formatted and made 'platform-ready'—that enables the emergence of a new mode of perception, and indeed a reformulation of visuality itself" (5). But how did we get from the early technologies of machine vision—like photography and film—to the post-cinematic and AI-powered forms of "platform seeing" that now define visual culture? Or, to put it in Benjaminian terms: what happened to the image form in the transition from the age of mechanical reproduction to the so-called age of AI?

A central focus that is addressed in a selection of the articles in this special issue deals directly with how the automation of vision has changed the image form, specifically concerning an historical relationship between the image and notions of truth and evidence. This is explored within the wider contemporary context of what has been termed a "post-truth" society. Indexicality, a concept describing the relationship between a sign and its referent and originating in the semiotic theory of Charles

Sanders Pierce, has historically grounded this relationship between truth and the image. The concept has been further theorized in photographic discourse framing the photographic image as evidence, in its record of a physical trace of an event. The contributions that take up this concept in their analyses hone in on the machinic image, its disruption of indexical relationships, and how its forms of representation can be understood in light of this concept. Indexicality is both reexamined in its historical development as well as reconstituted with relevance to the contemporary contexts of machine vision implementation, its production of an algorithmic image, and the challenges it presents to notions of an evidentiary aesthetic. The contemporary machinic image is approached as a site where historically contested ideas about vision and visuality are present. Rather than relying on a notion of an objective truth, the machinic image and its reconstitution of indexicality is understood as representing the *conditions* from which truth is constructed in contemporary society.

The following two contributions further complicate an understanding of indexicality in two distinct arenas of machine vision implementation: deepfake image production and the development of automated facial recognition technologies. Rebecca Uliasz, in her article titled "On the Truth Claims of Deepfakes: Indexing Images and Semantic Forensics," explores indexical relations in their production of deepfakes images, that is, digitally manipulated images and videos which falsely represent individuals and circulate widely online. She situates her inquiry into the wide scale production of deepfakes within a broader socio-political context of a contemporary struggle for truth and meaning in the visual. Her approach is framed by addressing the semiotic infrastructures of generative adversarial networks (GANs), a machine learning technique which aids in the production and implementation of deepfakes. The critical inquiry into GANs is grounded within contemporary sociopolitical discourse surrounding deepfakes, including a study into the status of deepfakes as evidence by DARPA's Semantic Forensics Program. Although representing a falsehood, deepfakes operate as evidence of the construction of truth in our contemporary visual regime. Through Uliasz's analysis on the phenomenon of deepfakes, she opens up an understanding of indexicality within the contemporary context of digital images, as traces of a relationship between technical and social registers including data sets, human

bias, and engineering decisions. In turn, Uliasz argues for an understanding of the ontology of deepfake images, which not only represent but generate ethicopolitical meaning within the wider contemporary context of post-truth media ecologies.

In Asko Lehmuskallio and Roland Meyer's article, titled "Experimental Indices: Situational Assemblages of Facial Recognition," the authors revisit the historical contexts upon which indexicality was premised both in the theory of Charles Sanders Pierce as well as through situated photographic practices to pluralize its understanding. Similar to Uliasz, Lehmuskallio and Meyer argue against a misguided understanding of indexicality in photography as incurring a transparent process and instead explore the processes of mediation, manipulation, and contingency of claims to a truth that continue in the contemporary context of automated facial recognition technologies. Lehmuskallio and Meyer focus on what they call the "experimental indices," that is, the varying situational assemblages of image apparatuses, including facial recognition technology, which form a material understanding of indexicality through its parameters and settings. They outline how mutable the notion of indexicality is and explore how different practices of contemporary facial recognition technologies produce their own set of experimental indices. Within this context, the authors address notions of a contemporary truth which is premised on a probability rather than certainty and problematize a long historied relationship of indexical relations which link bodies, images, and data.

If these contributions address the question of how machine vision technologies further unsettle the always-already unstable indexical relations between visual signs and their referents, the final two contributions to this special issue focus on the way that power inheres in imaging technologies, historically and presently. In the article "Automated Visions, Algorithmic Imageflows: The Technopolitics of Black Lives Matter Videos on YouTube," media theorist Jason Buel examines how proprietary algorithms intervene in the image flows of popular streaming platforms like YouTube. Far from representing a neutral patchwork of uploaded users' content, the video flows on YouTube are filtered through opaque recommendation algorithms that tailor content to specific viewer profiles while, paradoxically, appealing to an "idealized viewing position" free from ideological constraints. The

crucial question Buel raises is not what kind of ideological trickery may happen inside the "black box" but how forms of algorithmically curated representations actively *shape* and radicalize political subjectivities *by design*.

As Buel points out, YouTube, like many similar social media platforms, is built for "holding viewer attention (or, more accurately, collecting data assumed to stand in for viewer attention) and holding that attention as long as possible so as to commodify it and transform it into revenue." The result of this automating of visuality, Buel argues, is that a platform like YouTube tends to cater to spectacular and attention-grabbing content that too easily slides from, for instance, pro-Black Lives Matter videos toward more and more extreme forms of right-wing extremism. By algorithmically catering to viewers' engagement at any price, YouTube enacts a kind of late capitalist "subject formation" where it is ultimately, as Buel argues, "less about what any specific video has to say about the need for radical socio-political change and more about the viewing subject."

Buel's examination of Black Lives Matter videos in the context of YouTube's algorithmic curating of content challenges the idea that technological progress is inherently democratic, universal, and color-blind. As AI researcher Kate Crawford notes, long before most images ever reach the human eye, they have been bundled into "training sets," labelled, and sorted into categories that carry social norms and biases over into the visual field. What is usually referred to as the "black box," then, as sociologist Ruha Benjamin notes in her important book *Race After Technology*, often perpetuates forms of "routine anti-Blackness" and social inequity: "What I call the *anti-Black box* links the race-neutral technologies that encode inequity to the race-neutral laws and policies that serve as powerful tools for White supremacy" (35).

The idea that technology is never politically neutral but always reflects the social structure in which it was developed and employed is also a recurrent theme in this special issue's final contribution: an interview with the Egyptian-born contemporary artist Heba Y. Amin. Key to Amin's internationally acclaimed artistic practice is a critical exploration of the historical development of visual technologies in a context of colonial land-grabbing and exploitation, particularly in the Middle East and Africa. In

the conversation that took place over Zoom, Amin explains how early imaging technologies like panoramic photography were "at the core of visualizing the colonial project." Beginning from advanced imaging systems, such as drone and satellite vision technologies, Amin moves backwards in history to dissect some of the core assumptions that are built into and perpetuated by today's vision machines. Through a poetic lens, at once deeply historical and political, Amin's artistic practice and research thus offers a critical corrective to a "history of vision that has been, and continues to be, narrated through a Western 'universalist' perspective." Amin's contribution thus provides a timely and sobering view of the "future" of automation in the realm of vision as one necessarily haunted by a colonial past and fragmented along the broken, geopolitical lines and borders of capitalist modernity. What the "future"—itself an arguably time-worn Western trope—will *look* like is hard to tell. Most likely it will look different depending on where you look at it from. The effects of automation technologies, for better or worse, tend to be unevenly distributed.

Without further speculations, then, we happily hand over the word to the outstanding scholars and artists who have defied the pandemic condition of the past few years to generously share their research, time, and effort to help diagnose aspects of the "automation of visuality."

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