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Trevor Paglen's Border Abstractions in the Age of Machine Vision

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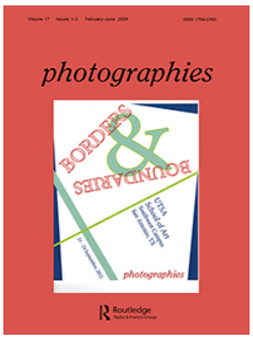

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TREVOR PAGLEN'S BORDER ABSTRACTIONS IN THE AGE OF MACHINE VISION

Over the past two decades, machine vision and artificial intelligence (AI) have become integrated into many aspects of daily life, and with machines generating images for other machines, humans are no longer at the centre of the image world. To explore the implications of the age of machine vision, this article focuses on a selection of work by American artist Trevor Paglen made between 2008 and 2018. It examines the significance of the US-Mexico border region as a site of his investigations and the role of abstraction in repositioning machine vision within the human-centred visual language of art. The article shows how Paglen's body of work turns toward the nonhuman to consider what it means to make images when representation is no longer primarily a site for the construction of meaning by humans but is also a field of data for analysis by machines. It explores how Paglen conveys the interplay between different models of vision with an aesthetic sensibility that develops from the history of photography but signals the breakdown of representational photography. His work highlights the contested space of the US-Mexico border region as a key site in a surveillance infrastructure that depends on a new regime of vision and offers a space to reflect on what it means to live in a world where most images are now made by and for machines.

Machine vision and artificial intelligence (AI) have become integrated into many aspects of daily life over the past two decades, and as machines increasingly generate images for other machines, humans are no longer at the centre of the image world. Facial recognition software, motion tracking devices, quality control systems, license plate readers, and automated pattern-recognition systems in military drones all produce images that are processed by artificial intelligence and are rarely seen by humans. German filmmaker Harun Farocki (1944–2014) described these machine-made images as 'operational images,' meaning they are part of the internal functioning of these technologies. Drones, for instance, are equipped with wide-area persistent surveillance (WAPS)

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cameras that produce operational images with highly detailed information for monitoring activity in a region.[1] Humans cannot understand these operational images because they consist of numerical data and render useless the tools of analysis from visual studies and art history.[2] Meanwhile, AI performs tasks that previously required human intelligence, such as identifying people in an environment, and if required can translate the data into images that follow visual conventions. But even though humans do not routinely see operational images, their proliferation and the AI infrastructure that collects and analyzes their data has radically changed the context for human generated photography.

Contemporary artists and filmmakers are at the forefront of investigations into how visual culture is transforming and what the environment of autonomous photography systems means for human-generated photography. Practitioners including Faroki, Laura Poitras (b. 1964), and Hito Steyerl (b. 1966) have scrutinized intersections between AI and the infrastructure of the surveillance state. American artist Trevor Paglen (b. 1974) is another leading figure in these inquiries, and this article focuses on a selection of his work made between 2008 and 2018. This was a crucial period of transition from a human-centred image world to a regime of machine vision because the global infrastructure for AI was in place by around 2012.[3] During this time, Paglen achieved international acclaim and the body of work under discussion was exhibited in several venues including in his mid-career survey, *Trevor Paglen: Sites Unseen*, curated by John Jacob, the McEvoy Family Curator for Photography at the Smithsonian Museum of American Art.[4] (Figure 1).

Trained as a geographer, Paglen is interested in the social production of space and the power relations that govern how space is used.[5] In artwork exploring the infrastructure of

Fig. 1. Installation view, *Trevor Paglen: Sites Unseen*, Smithsonian American Art Museum, 2018. Photo by Sarah Bassnett.

state secrecy and surveillance, Paglen has photographed supermax prisons, classified military installations, satellites, the infrastructure of the internet, and more. His investigations have taken him to heavily monitored sites, including landing stations for internet communication infrastructure, intelligence agency data centers, and the US southern border region. While curators and critics have discussed Paglen's work in terms of surveillance and space, little attention has been paid to the significance of the border as a site of his investigations. Similarly, Paglen's interest in the history of American landscape photography is often highlighted, but the way he engages with theories of representation and abstraction in photography has not been adequately discussed.

This article addresses these gaps by focusing on a body of work that uses a variety of methods for making surveillance — especially border surveillance — visible to explore the impact of AI on photographic representation. I consider the shift away from late twentieth-century theories of representation to a new era dominated by AI and look at how Paglen furthers our understanding of the waning era of representational photography and the rise of a regime of machine vision. Looking back to theories of representation from the late 20th century, we see how scholars focused on photography as a site where meanings and power effects are produced. They considered how photography was established as a form of evidence in the sciences and as a disciplinary method essential for a functioning modern state during the 19th century, while artists examined how subjects are constituted in relation to text and image. This important research deconstructed the idea of representation as the process of making visible a prior truth and critiqued the notion of a pre-existing subject.[6] It also opened the way for discussions of the relationship between power and knowledge, including how, from the mid-nineteenth century, photography provided techniques of surveillance. Instead of interpreting visual representations as expressions of, or reflections of, pre-existing cultural conditions, scholars and artists concerned with the politics of representation examined the constitutive role of photography in the production of meaning.[7] Paglen's body of work turns toward the nonhuman to investigate recent changes in the status of representation, and specifically how it is transformed by the world of data. His work engages with a movement to consider the co-existence of the human and nonhuman,[8] yet it signals a new era — one in which representation is no longer primarily a site for the construction of meaning by humans but is also a field of data for analysis by machines.

Machine vision

Paglen's early investigations of machine vision consider connections between surveillance technology from different eras. He began thinking about the impact of machines on human visual culture through traditions of landscape photography, and then in the series *The Other Night Sky* (2007-present) he looked skyward to satellite surveillance and the infrastructure of secrecy. Works such as *KEYHOLE-IMPROVED CRYSTAL from Glacier Point (Optical Reconnaissance Satellite, USA 186)* (2008) allude to historical uses of the landscape genre in geological surveys, which were colonial tools for land acquisition and resource development (Figure 2). But the series also refers to a network of contemporary reconnaissance satellites through traces that appear as white streaks in darkened skies. In referencing geological surveys and reconnaissance

Fig. 2. Trevor Paglen, *KEYHOLE IMPROVED CRYSTAL from Glacier Point (Optical Reconnaissance Satellite; USA 186)*, 2008. C-Print 37 ½ × 30 in. © Trevor Paglen, courtesy of the artist, Altman Siegel, San Francisco, and Pace Gallery.

satellites, curator John Jacob notes that these artworks 'merge into a single composition two historically disparate moments of geographic and celestial colonization.'[9] Integrating systems of surveillance from different time periods together in a single image conveys how intelligence gathering has changed but also how the state and corporations retain their power by controlling the production and use of images.

Relations of power are central to Paglen's concerns because AI systems are often treated as though they are autonomous and rational, but corporations and nations direct their development and benefit from their operations. Communications scholar Kate Crawford argues that AI algorithms are 'expressions of power' that follow the extractive logic of information capitalism.[10] Their reliance on resource extraction and the mass capture of data consolidates and centralizes power in the very institutions that support it.[11] Paglen investigates these ideas by developing a visual language to show viewers how AI harvests the real world as data. In this way he explores the intersection between power and representation and considers how AI affects human

visual culture. While photography has a long legacy both as a tool of oppression and as a means of resistance, in the age of machine vision, it is co-opted by algorithms that magnify inequality.[12] Paglen engages this history by creating photographs that reposition machine vision within the human-centred visual language of art.

In his search to develop a visual language for the geography of intelligence gathering, Paglen created an abstract rendering of a surveillance apparatus used for border security. The photographic work *The Fence (Lake Kickapoo, Texas)* (2010) is based on a high-frequency radar perimeter used in monitoring US air space (Figure 3). 'The Fence' is the colloquial name of a surveillance system designed to track satellites and protect the US from space debris or ballistic missile attack. Managed by the US military, the system was in operation from 1961 until 2013 and had its origins in national security concerns during the Cold War.[13] The Fence was challenging to photograph because radar is transmitted below the visible light range and is normally invisible. Paglen made this image of the electromagnetic border using a radio telescope optimized for the radar frequency. In the artwork, the radar waves are visible as a diffuse texture across a spectrum of colour from blood red to pale yellow, yet they are

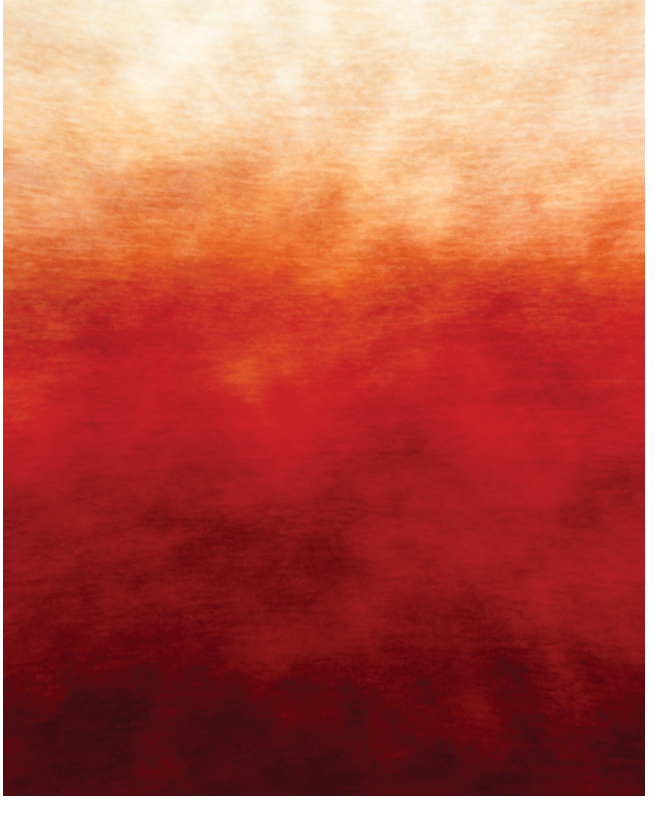

Fig. 3. Trevor Paglen, *The Fence (Lake Kickapoo, Texas)*, 2010. C-Print 50 × 40 in. Amon Carter Museum of American Art, Fort Worth, Texas © Trevor Paglen. Courtesy of the artist, Altman Siegel, San Francisco, and Pace Gallery.

Fig. 4. Air force space surveillance system, part of the master transmitter antenna at Lake Kickapoo, Texas, c.2001. Photograph by an employee of the United States government. Creative commons public domain image.

hard to interpret. In contrast to a photograph of the technology that is used to generate the radar waves (Figure 4), which portrays a landscape dominated by equipment, Paglen's photograph uses light and colour to represent the density of the signal that forms the defense system. In other words, instead of picturing the technology, he conveys its effect. This turn toward abstraction offers a new way of conceiving of surveillance technology that features in another series from around the same time focusing more specifically on the southern border region.

Border surveillance

The US-Mexico border is a key site for surveillance and AI data collection and is a notable setting in Paglen's work. Although today the region is a militarized zone under intense scrutiny, this has not always been the case. In fact, when the US established a border patrol agency in 1924 to enforce restrictions on immigrants from Asia and southern Europe, most agents were posted at the northern border with Canada.[14] Over the course of the 20th century, the security focus shifted to the southern border, and in the 1980s under the Reagan administration, the US military began to supply the border agency with surveillance equipment. In 1994, a new set of policies known as Prevention Through Deterrence increased border patrols and technology around centralized entry points. This strategy, which relied on drones and other automated

systems for producing, transmitting, and processing images, increased the security infrastructure in the southern border region.[15] After 11 September 2001, the border became an even more complex apparatus mediated by numerous technologies, including motion sensors, radar systems, facial recognition software, infrared cameras, and autonomous surveillance towers, which use AI. All this infrastructure forms a 'smart border' that monitors for movement and, using ground-penetrating radar, can even detect subterranean tunnels.[16] Currently, the border is not a straightforward demarcation line but is rather a complex and mainly invisible system monitored by automated data collection systems.[17] The region is also a highly politicized and contested space at the heart of debates over issues such as who is allowed to enter the US and how the border itself is monitored.

Space and time are key factors in border security, and scholars in fields from philosophy to geography have shown how twenty-first-century borders have become externalized and spatially ambiguous through bureaucratic and legal processes.[18] The Southern Border Plan, a 2014 security agreement between the US and Mexico, is a prime example of the reformulation of the border as a system in which US enforcement extends along migration routes all the way to the Mexico-Guatemala border.[19] At the same time, human geographers have also argued that contemporary borders are as much about time as they are about space. Regulations control the speed and mobility of goods and people across national boundaries, creating barriers for some and expediting passage for others.[20] The control of space and time together regulate access to political rights in these regions, and borders are increasingly designed to manage the pace of international mobility and access to a political community rather than to block mobility and migration entirely.[21]

This externalized approach to boundary regulation privileges some at the expense of others and aligns with sociologist David Lyon's description of borders as 'sites of surveillance' where people receive differential treatment according to how they are categorized.[22] As Lyon points out, governments claim that surveillance systems are designed to increase efficiency, productivity, welfare, and safety, but they achieve these goals by regulating behaviour.[23] The result, as cultural theorist Simone Browne explains, is that surveillance has differential effects because it structures and controls social relations along racial lines.[24] As borders have become complex systems monitored by AI, inequality has only intensified. Paglen's work in the border region makes visible the infrastructure of power: he exposes the satellites used for gathering intelligence, the radar for monitoring air space, and the drones for border security. The regime of machine vision has shifted the relationship between images and power, and in coming to terms with AI, Paglen engages with the limits of representation itself.

In the series *Untitled (Drones)*, 2010–14, Paglen no longer examines the effects of technology, as in *The Fence (Lake Kickapoo, Texas)*, but instead translates the experience of the landscape into sensation. To make the work he set up a view camera with a wide-angle lens at a testing area for drones in the Nevada desert.[25] But subverting conventions of landscape photography, he eliminates the horizon line and creates skyscapes in which the pale yellows, oranges, blues, greens, and pinks further minimize the appearance of the barely discernible specks that are the predator and reaper drones (Figure 5). These large-scale chromogenic photographs concentrate on light and hue, making each work a sensory encounter with a dazzling sky. Displayed in a gallery setting, the effects of light linger

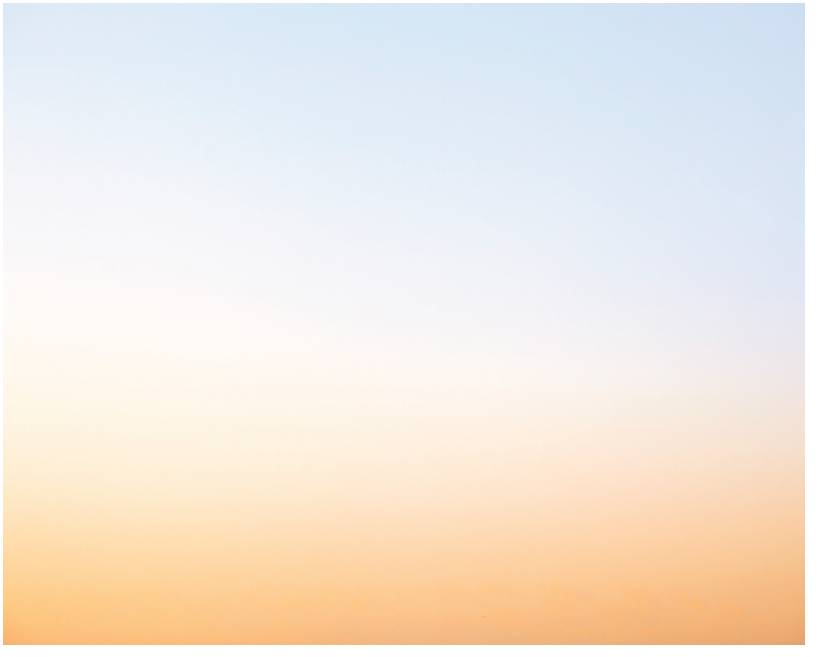

Fig. 5. Trevor Paglen, *Untitled (Reaper Drone)*, 2012. C-Print 48 × 60 in. © Trevor Paglen. Courtesy of the artist, Altman Siegel, San Francisco, and Pace Gallery.

from one work to the next, invoking the sensation of temporary blindness that human eyes experience from too much light. The sensory impression of the work plays on the visual language of the sublime by at once reminding us of our physical vulnerability and captivating us with radiant colour. Jacob describes the work as both recognizing 'the sky as a politicized space' and as reclaiming that space 'for the wonder of looking.'[26] Certainly, the names of the drones referenced in the titles remind us that the sky, like the land, is a political domain, even as the work is a joy to behold. But more than that, Paglen's turn to abstraction is a way of engaging with the coexistence of presence and absence. To use Rosalind Krauss's terms, we could describe Paglen's approach in this series as 'holding the referent at bay,'[27] wherein the subject of surveillance is not represented but is instead sublimated into a sensation.

Another way of thinking about this is that surveillance is frequently less something we see and more something we feel, and Paglen's investigation of drone vision interrogates the relationship between looking and feeling. Because sensory experience separates humans from machines, it is curious to encounter a work that revolves around a machine mimicking human sight. But that is what we get in the experimental video *Drone Vision* (2010), which uses source footage intercepted from an open channel of a commercial communications satellite (Figure 6).[28] The footage of this silent video is a compilation of moments selected from when the drone was rotating its field of vision to capture a different view.[29] Drones are designed to focus on a target, and these segments of video invert that function by considering what a machine might see with human-like vision. The movement of the camera rotating

Fig. 6. Trevor Paglen, *Drone Vision*, 2010. Single-channel SD video, no sound 5 min, 20 seconds. © Trevor Paglen. Courtesy of the artist, Altman Siegel, San Francisco, and Pace Gallery.

slowly over the landscape is cinematic. Like a roving eye, it searches for something on which to focus, but unlike human vision, which is binocular and seeks pleasure and meaning, this machine lacks purpose unless programmed to find a mark. If the era of representational photography was about how images constitute subjects who produce meaning and effects, the role switching of *Drone Vision* (a machine mimicking a human) shows how machine vision shatters that model. Here, the drone fails to produce a subject, just as it fails to perform a task or produce data. Neither a conventional portrayal nor an operational image, the artwork points to a rupture in the field of representation and the co-existence of human and nonhuman, a provocation Paglen takes up in later work on the US-Mexico border.

Whereas the *Untitled (Drones)* series transforms the landscape of security into a sensory experience of light, the quadriptych *Four Clouds* (2017) explores another way to render AI surveillance visible. In this work, Paglen portrays cloud formations over the US-Mexico border as they are interpreted by the image-recognition algorithms of drones (Figure 7). Algorithms attempt to simplify images by looking for underlying lines and sections, and Paglen focuses on cloud formations because the image-recognition software used in drones is designed to identify people and vehicles, so it finds clouds difficult to interpret.[30] The shapes and lines visible in the photographs indicate what AI detects and how it categorizes image content. *Four Clouds* offers a fascinating inversion of machine vision by making visible to human viewers how machines 'see.' The artwork is in dialogue with, but contrasts, the kinds of machine-readable images produced by the autonomous surveillance towers that monitor the

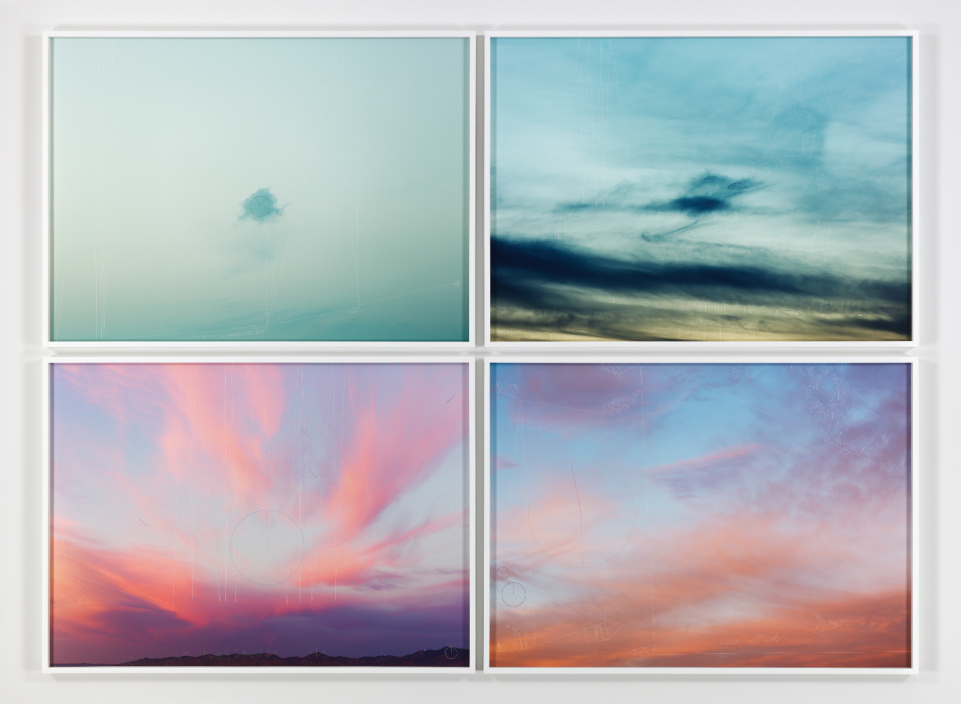

Fig. 7. Trevor Paglen, *Four Clouds Scale Invariant Feature Transform; Maximally Stable Extremal Regions; Skimage Region Adjacency Graph; Watershed*, 2017. Set of four pigment prints 33 × 46 in. © Trevor Paglen. Courtesy of the artist, Altman Siegel, San Francisco, and Pace Gallery.

Fig. 8. Screen capture image showing the area in South Texas monitored by an autonomous surveillance tower and indicating where it detected a border incursion. The inset provides border patrol agents with a view on the ground. Customs and border patrol image reproduced in John Davis, 'A watchful eye,' customs and border patrol, https://www.cbp.gov/frontline/watchful-eye.

border region (Figure 8). These surveillance systems are designed to detect border incursions, track targets, and alert border agents. Although much of the data they generate is only ever accessed by other machines, some of it is translated into a form legible to humans, such as a topographic view, in order to guide border agents to the location of an incursion. So, the contrast is this: whereas AI translates images from surveillance towers for border patrol agents to locate a target in space and to see a view on the ground, Paglen maps machine vision onto photography to show the co-existence of two very different models of vision — human and machine.

Abstraction

It is no coincidence that Paglen turns to the visual language of abstraction to explore the limits of representation in the age of machine vision. As a movement, abstraction is often associated with painting and sculpture, but it has deep roots in photography as well. As David Bate shows in his discussion of Daguerre's first photographs, abstraction has had a place in photography from the start.[31] In painting, Bate explains, abstraction is commonly understood as a form of expression that is liberated from representation, whereas in photography, abstraction signifies the interplay between presence and absence.[32] Paglen's skyscapes are contingent on this history and reference the work of acclaimed photographer Alfred Stieglitz, who made over 350 photographs of clouds in the 1920s and early 30s as an

Fig. 9. Alfred Stieglitz, *Equivalent*, 1930, gelatin silver print, 3.5 × 4.3 in., Alfred Stieglitz collection, 1949.806, Art Institute of Chicago. Reproduced under creative commons zero public domain designation.

exploration of abstract form. (Figure 9) For Stieglitz, clouds were subject matter not weighed down with social and political meaning and so they were a form with which to express 'pure emotion.'[33] For Paglen, clouds as subject matter show just how different the regime of vision is now. Instead of allowing for a formal investigation of the expressive potential of photography, clouds now signify how the automation of vision obscures the relationship between images and the systems of power in which they operate. In Paglen's work, abstraction connects the past and future of photography because viewers oscillate between seeing clouds and seeing how a machine attempts to turn those clouds into data. Paglen's abstraction retains some of the expressiveness of Stieglitz's abstraction through aesthetic values of light, colour, and composition, but his work reminds us that today we share the world with machines that operate independently, shaping who we are and how we see.

In another work, *Near Nogales Maximally Stable Extremal Regions; Good Features to Track*, 2017, the political stakes of machine vision are again suggested in a turn from the sky back to the landscape (Figure 10). The border region as a site of surveillance is indicated by the title, *Near Nogales*, which locates this landscape in Nogales, Arizona, a city that borders on Nogales in the state of Sonora in northern Mexico. The title also references MSER (maximally stable extremal regions), a technique used by object recognition algorithms to detect corresponding image elements. A detail of the work shows the image elements that the algorithm has focused on in this landscape (Figure 11). The green shapes and red dots are not in the scene itself but rather are evidence of the algorithm trying to make sense of the scene by identifying its component parts. Looking at this artwork from a distance, viewers

Fig. 10. Trevor Paglen, *Near Nogales Maximally Stable Extremal Regions*; Good Features *to Track*, 2017. Pigment print 28 ½ × 40 in. © Trevor Paglen. Courtesy of the artist, Altman Siegel, San Francisco, and Pace Gallery.

Fig. 11. Trevor Paglen, *Near Nogales Maximally Stable Extremal Regions; Good Features to Track*, 2017 (detail). Pigment print 28 ½ × 40 in. © Trevor Paglen. Courtesy of the artist, Altman Siegel, San Francisco, and Pace Gallery.

see a landscape constructed for human vision. We see a horizon line, the play of light and shade that defines the hills, shrubs, and clouds, and the fore, middle, and background that creates the appearance of a recession into space. But a closer look reveals abstract shapes that convey how machine vision perceives the landscape to extract data. By portraying traces of algorithms at work on a desert landscape, the artwork challenges the idea, cultivated by many corporate and state supporters of AI, that machine vision is an unbiased technological development. The visible markings of AI gathering data instead suggests how algorithms are implicated in the exercise of power. *Near Nogales* connects 19th-century American survey photography with the present, suggesting that AI is another form of colonial extraction in which corporations and governments mine data for their own interests.[34] The work references the co-existence of different traditions of representation and asks what it means to be human in a world that operates according to machine vision.

Paglen has pointed out that while humans have a cultural vocabulary to analyze human-made images, we lack a language to analyze machine images.[35] The abstract shapes and lines in artworks such as *Four Clouds* and *Near Nogales* provide a basis for understanding machine images by offering insight into the way AI turns the world into data. The work shows humans how machine vision gives technology the ability to 'see' and allows us to imagine how machines may respond to the patterns and data it perceives. In its operation and its effects, machine vision is different from generative AI, which produces new images from text prompts.[36] While we are only starting to come to terms with generative AI, machine vision is already deeply embedded in and has transformed our everyday lives. It operates the facial recognition software on our smartphones and at border crossings and conducts quality

control in manufacturing. Paglen's work conveys the interplay between different models of vision with an aesthetic sensibility that develops from the history of photography and its fundamental connection to abstraction but signals the breakdown of representational photography and a turn towards the nonhuman. The US-Mexico border region is a contested space and a key site in a surveillance infrastructure that depends on a new regime of vision, and Paglen's work alludes to its significant role in the rise of machine vision. The artwork also offers a space to reflect on state surveillance and what it means to live in a world where most images are now made by and for machines.

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Notes

1. Leers, *Mirror with a Memory*, 79. Drone is the common term for unmanned aerial vehicles (UAV). The WAPS camera captures and analyzes image data from an area with an approximately thirty-mile radius.
2. Paglen, "Operational Images"; and Pantenburg, "Working Images", 49–62.
3. Steyerl and Paglen, "The Autonomy of Images", 251.
4. Jacob and Skrebowski,*Trevor Paglen*. A few of the works discussed were also exhibited in *Surveillance States: Trevor Paglen*, curated by Scott McLeod at Prefix Institute of Contemporary Art during the Scotiabank Contact Photography Festival. This small exhibition presented a series of the artist's photographs alongside two of his video installations to consider the role of surveillance in everyday life. See *Prefix Photo* 37 (May 2018).
5. Paglen, "Experimental Geography," 26–33; and Jacob, "Trevor Paglen," 26–28.
6. Foundational texts include: Donald, "Editorial," 1–4; Rosler, *Three Works*; Burgin, *The End of Art Theory*; Sekula, "The Body and the Archive," 3–64; Pollock, *Vision and Difference*; and Tagg, *The Burden of Representation*.
7. On the politics of representation, see Hall, "The Work of Representation," 1–47.
8. See Grusin, "Introduction," vii–xxix.
9. Jacob, "Trevor Paglen," 47.
10. Crawford, *Atlas of AI*, 211–17.
11. Ibid., 10–11.
12. Trevor Paglen, "Invisible Images"; and Crawford and Steyerl, "Data Streams."
13. Three transmitter sites were located in the southern US at Jordon Lake, Alabama; Lake Kickapoo, Texas; and Gila River, Arizona. R. Cargill Hall, "Civil-Military Relations in America's Early Space Program," *The US Air Force*

in Space, 1945 to the Twenty-First Century, ed. R. Cargill Hall and Jacob Neufeld. (Washington, DC: United States Air Force, 1998), 26; and Stacy Glaus, "End of an Era for AFSSS," Peterson Air Force Base, US Air Force, October 9, 2013, https://web.archive.org/web/20140324231726/http://www.peterson.af.mil/news/story.asp?id=123366499.

14. Jones, *Violent Borders*, 33.
15. Dunn, *The Militarization of the US-Mexico Border, 1978–1992*, 103–40, 161–63; and Jones, *Violent Borders*, 34–35.
16. Jones, *Violent Borders*, 36–37. Also see Miller, *Empire of Borders*, 74–78.
17. See Pötzsch, "Capturing Clouds," 65–82.
18. For instance, see Balibar, *Politics and the Other Scene*, 91; and Mountz, "The Enforcement Archipelago," 118–28.
19. Nolen, "Southern Exposure."
20. Martina Tazzioli, "The Temporal Borders of Asylum," 13–22; and Axelsson, "Border Timespaces," 59–74.
21. Axelsson, "Border Timespaces," 62.
22. Lyon, *Surveillance Studies*, 26–27.
23. Ibid.
24. Browne, *Dark Matters*, 16.
25. Visibility Machines: a conversation with Harun Farocki and Trevor Paglen, in association with an exhibition at University of Maryland, Baltimore, 2013. National Gallery of Art, https://www.nga.gov/audio-video/audio/faroki-paglen.html.
26. Jacob, "Trevor Paglen," 69.
27. Rosalind Krauss, "Photography and Abstraction," 66.
28. See note 26 above.
29. Ibid.
30. Jacob, "Trevor Paglen," 77; Benney and Kistler, "Trevor Paglen"; and Chakrabarti, "Do Androids Dream of Representative Art?"
31. Bate, "Daguerre's Abstraction," 136–39.
32. Ibid., 139–44.
33. Alfred Stieglitz, "How I Came to Photograph Clouds," *Amateur Photographer and Photography* 56 (1923), reprinted in Richard Whelan and Sarah Greenough, ed. *Stieglitz on Photography: His Selected Essays and Notes* (New York: Aperture, 2000), 237.
34. On AI as an extractive industry, see Crawford, *Atlas of AI*, 211–27.
35. See note 25 above.
36. Paglen explores generative AI in subsequent bodies of work starting in 2017.

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Disclosure statement

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