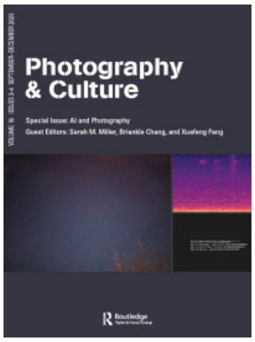

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Computational Photography: The Production of Perpetual Targets

Ekalan Hou

Abstract

Using iPhone camera updates since 2021 as a case study, with a focus on the incorporation of panoptic segmentation networks and LiDAR sensors, I trace the militaristic substrate of computational photography and the camera's increasingly precise classification and spatial mapping of users. I link the discorrelation of smartphone users with both the exploitation of low-paid microworkers and the dissimulation of racialized enemy combatants to theorize their shared expenditure under the military-security-industrial complex and the indiscriminate apparatuses of a counterinsurgent world.

Keywords: computational photography, discorrelation, surveillance, counterinsurgency, AI, militarism

> "The computerization of society has essentially been a side effect of the computerization of war."
>
> —Frank Rose, *Into the Heart of the Mind* (1984)

> "All movies are ghost stories since all cameras are haunted."
>
> —Denise Ferreira da Silva and Arjuna Neuman, *Ancestral Clouds* (2023)

Around 1.94 trillion photos were taken worldwide in 2024, of which smartphone photography accounted for 94**%** (Broz 2024). "Photography has become a primarily computational medium," writes Brooke Belisle in *Depth Effects* (2023). Although the camera app simulates analog photography, with the click of the shutter and the blink of darkness, apertures on smartphones are never shut. The press of the shutter button merely brackets the range of data that was already being captured as soon as the camera app is launched. Rather than indexing an instantaneous drawing with light on a photosensitive surface, computational photography triggers automated compositing processes, pattern recognition algorithms, pixel-by-pixel optimizations, and depth mapping—in-camera alterations that occur prior to the fact of capture. The key distinction of computational photography, as Taffel (2021, 252) points out, is that "in place of a single image whose moment of capture is based upon a human actuating a shutter mechanism, each image is a composite with elements of the recording process" and data-intensive operations preceding human intervention. In other words, computational photography is characterized by microtemporality and subperceptuality—the manipulation of photographs by neural networks trained on datasets of annotated images that precedes and structures the user's perception (Denson 2020).

The consideration of computational photography requires a reorientation from the visual to the invisual, to borrow Jussi Parikka's phrase, a shift "away from images toward their infrastructural coupling with large-scale systems of sensing and computation" and their entanglement with "real-time processes of dynamic sensing" (2023, 204). Rather than locating the exercise of power at the end of the photographic process—at the moment of capture—new media theorists from Parikka to Paglen (2016) demonstrate that in computational photography, molecular policing and market operations take place in the "invisible world" of machine-machine interactions, outside of human perceptibility. Florian Sprenger emphasizes that temporality is crucial to understanding how algorithmic processes operate: "The temporality of microdecisions is an effect of sheer mass calculations and the speed of automated processing. Microdecisions exceed human capacities because their numbers and speed can only be accomplished by computers" (2022, 625). Microdecisions are decoupled from sovereign decision-makers; they are effective precisely because they take place automatically. As digital computation interpolates life at the pace and scale of the microtemporal and microspatial, algorithmic governance takes place prior to the user's intentionality (Gerba 2024). Faster than the blink of an eye, algorithmic operations precede and condition subjective awareness and delimit the horizon of our aspirations and desires (Denson 2023a, 304; Denson 2023b, 41). The user's subjectivity is preformatted at the subperceptual stage; control is extended at the level of prepersonal embodiment.

Analyzing the classificatory and militarized substrate of computational photography, I focus on how invisual technologies like panoptic segmentation and LiDAR have ordered the visible world into classes, populations, and targets prior to its visualization. These aesthetic modulations become technical means of control that bypass the users' perceptual present to anticipatorily format a world according to the logic of determinacy and separability (Ferreira da Silva 2016). Paola Ricaurte points to the multi-tiered and linked epistemic violence perpetrated by AI: "At the systemic level, AI technologies are used geopolitically as a war machine, as part of a military industrial complex and as a strategic tool for surveillance of the global poor" (2022, 727); at an institutional level, AI mediates management as an invisible infrastructure; and at the micropolitical level, AI mediates the production of subjectivities, where through "algorithmically mediated ways of being, knowing, feeling, doing, and living, life automation contributes to the emerging underclass of computable beings, precarious invisible workers, and colonized consciousness" (728). Invisual technologies' microscale structuring of user perception is informed by their macroscale exploitation of the global precariat and "neutralization" of insurgent targets. With each press of the shutter, segmentation architectures in smartphones slice the world into simplified and unambiguous categories and automate the user's acceptance of these classifications—a parsing that even under the most mundane circumstances recalls the counterinsurgent and militaristic aims that motivated the algorithm's development. The increasing precision of segmentation does not stop at lifting figures from the background in portrait mode but is trained to better pinpoint enemy targets for "prophylactic elimination" (Chamayou 2015, 34; Hristova 2022, 152).

Panoptic segmentation

In an article on the October 2021 update to the iPhone camera, the Apple machine learning research program announced that "pixel-level understanding of image content, also known as *image segmentation*, is behind the app's front-and-center features":

> Person segmentation and depth estimation powers Portrait Mode, which simulates effects like the shallow depth of field and Stage Light. Person and skin segmentation power semantic rendering in group shots of up to four people, optimizing contrast, lighting, and even skin tones for each subject individually. Person, skin, and sky segmentation power Photographic Styles, which creates a personal look for your photos by selectively applying adjustments to the right areas guided by segmentation masks, while preserving skin tones. Sky segmentation and skin segmentation power denoising and sharpening algorithms for better image quality in low-texture regions. (Orhon et al. 2025)

The research paper remarked that "this year, [Apple] reached "an initial milestone of predicting both subject-level and scene-level elements with an on-device panoptic segmentation model that predicts the following categories: sky, person, hair, skin, teeth, and glasses." Trained on an "internal dataset of around 4 million images," with "roughly 1500 categorical labels" (Orhon et al. 2025), iPhone's panoptic segmentation architecture recognizes and parses subjects and backgrounds into masks, and "optimizes" them through adjustments in contrast, lighting, and skin tone. Photographs are automatically doctored at the level of skin, hair, and teeth.

Prior to the introduction of panoptic segmentation, scholars of digital cultures have already commented on the iPhone camera's irreducibility to its photographic function and its imbrication with locational technologies, machine-learning algorithms, and neural processing units. Daniel Palmer notes that Apple's "transformation of the camera into a digital sensor" (2012, 87) through the introduction of CMOS sensors—which wipe the shutter across the sensor like a scanner—has profound implications for how we might understand photography. Chris Chesher likewise writes that the "iPhone camera moves into significantly different existential territories from its recent progenitor" (2012, 100) because when the iPhone camera snaps a scene, it is not merely "optics and a photo-sensitive surface that determine the outcomes, as with conventional cameras," but that the device can perform "many combinations of digital operations, including analyzing the image data, performing algorithmic changes, connecting to other data spaces and storing image files" (98). In the words of Knaan (2017), a researcher in computational photography at Google, while digital photography treats each pixel as a pixel, computational photography tries to "understand" what each pixel is. Although digital photography has always required algorithmic processing, such as demosaicing or adjusting the contrast curve, computational photography uses machine learning to classify and to doctor each pixel based on training data. These datasets can be labelled in advance by humans, in the case of supervised machine learning, or be scraped from web searches, voice data from Google assistants and Siri, and from the locational data and the billions of photographs taken on smartphones, in the case of unsupervised learning (Mackenzie 2017; Taffel 2021, 249). Chesher considers the iPhone camera "a multi-purpose input device" that parallels battlefield and security cameras—its development drawing upon "decades of university, military and commercial research into image analysis, image transformation, character recognition, head-up displays, and so on" (2012, 114). Chesher's comment evinces the inseparability between advancement in media technology, military desires, and commercial success. The civilian media technologies we use daily—which are always becoming more convenient, precise, and predictive—tend to be the "byproducts or waste products of pure military research" as Kittler points out (2010, 74; Packer and Reeves 2020, 9). Understanding that "media history without the military-industrial complex is ultimately deeply misguided," as Peters (2010, 16) writes, I trace the development of image segmentation in iPhone cameras alongside the life-times it expends or seeks to lay to waste.

Racialized classifications and the exploitation of low-paid crowdsourced workers serve as the ground of image segmentation's emergence, and the militarized pinpointing of enemy targets justify its refinement. Image segmentation refers to the segregation of a digital image into multiple regions according to the different properties of pixels (Sultana, Sufian, and Dutta 2020). Image segmentation is primarily divided into semantic segmentation and instance segmentation; and the unified version of the two segmentation processes is called panoptic segmentation. Early developments in semantic segmentation, "which aims to assign a semantic label to each pixel from a predefined class set" (Wei et al. 2016), relied on pretraining deep convolutional neural networks (DCNNs) with a large-scale image classification dataset and then transferring the pretrained parameters to segmentation tasks (Chen et al. 2018; Long, Shelhamer, and Darrell 2015). One of the first successful semantic segmentation models based on CNN was the AlexNet in 2012, trained on Fei-fei Li's ImageNet (Krizhevsky, Sutskever, and Hinton 2012). Subsequent DCNN semantic segmentation models like VGGNet (Simonyan and Zisserman 2015) and GoogleNet (Szegedy et al. 2015) likewise trained on ImageNet, having developed out of the ImageNet Large Scale Visual Recognition Challenge (Russakovsky et al. 2015). ImageNet, a benchmark object classification and detection training set since its release in 2009, consists of over 14 million labeled images across 22,000 categories (Deng et al. 2009). With an underlying semantic structure imported from WordNet, a database of word classifications developed at the Princeton Cognitive Science Lab, funded by the US Office of Naval Research, ImageNet preserved the harmful slurs from WordNet's corpus (Crawford 2021; Fellbaum 1998). Kate Crawford and Trevor Paglen critique ImageNet's gendered, racialized, ableist, and ageist taxonomies in "Excavating AI" and point to the brutality of the dataset's classificatory system, which recalls nineteenth-century scientific racism and the ordering of humans into "types" (Crawford and Paglen 2021, 1110). Not only are people reduced to categories that perpetuate "heteropatriarchy, racial capitalism, white supremacy, and coloniality" (Tacheva and Ramasubramanian 2023, 2), but their images have also been culled from the Internet without their knowledge or consent. The development team of ImageNet scraped millions of images from the internet, and exploited underpaid piecemeal workers, employed through Amazon's online labor platform Mechanical Turk, to undertake the formidable task of labeling millions of photographs—sorting 50 images per minute into thousands of categories (Markoff 2012). As new semantic segmentation architectures are built with AlexNet, VGGNet, or GoogleNet as a base network, their training is haunted by ImageNet's taxonomic logic and its exploitation of microworkers.

Instance segmentation moves one step beyond semantic segmentation and aims to identify individual instances of different semantic categories (Wu, Shen, and Hengel 2016). It not only assigns class labels like "car" or "dog" to semantic objects, but it also distinguishes between different instances of the same class, such as different vehicles or breeds of dog (Li et al. 2017; Figure 1). Instance segmentation was introduced by Hariharan et al. (2014) but was popularized by Microsoft's COCO (Common Objects in Context), a large-scale dataset with 328,000 images and 2,500,000 labeled instances (Lin et al. 2015). If ImageNet had been crucial in enabling breakthroughs in semantic-level object classification and detection, Tsung-Yi Lin et al. from Microsoft hoped that their dataset could become the new benchmark dataset for instance-level scene understanding. Although MS COCO has fewer object categories than ImageNet, each of the object categories opens onto more than 5000 labeled

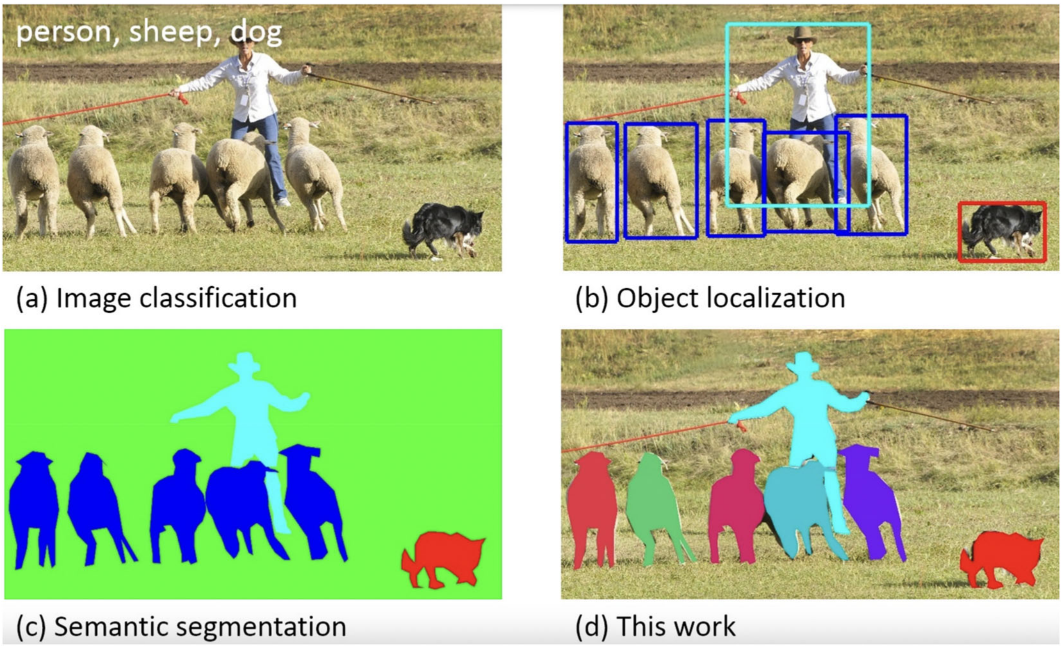

Figure 1. Distinctions between image classification, object bounding-box localization, semantic pixel-level segmentation, and instance segmentation. Tsung-Yi Lin et al. "Microsoft COCO," 1.

instances. The MS COCO segmentation challenges, like the ImageNet Large Scale Visual Recognition Challenge (ILSVRC), ensured that most instance segmentation models—such as Jifeng Dai et al.'s region-based fully convolutional networks (2023), Yi Li et al.'s fully convolutional instance-aware semantic segmentation (2017), Kaiming He et al.'s Mask R-CNN model (2018), Liu et al.'s Path Aggregation Network (2018), and Chen et al.'s TensorMask (2019)—all use MS COCO as their test dataset and measure of precision.

MS COCO, akin to ImageNet, relied upon "extensive use of the Amazon Mechanical Turk" (Lin et al. 2015, 2). After the MS COCO team collected images from Flickr, they employed microworkers who spent a combined 70,000 h cleaning, segmenting, and annotating the dataset with 2.5 million instance-labels (Lin et al. 2015, 10). According to a Pew Research Center report from 2016, "microtasks" such as classifying images paid 10 cents or less per task on the Mechanical Turk platform (Hitlin 2016, 6). Turkers generally earned less than $5 an hour. A worker who performs tasks for 40 h a week without taking a vacation would earn $10,379.20 per year before taxes (Hitlin 2016, 8). The precarity of the "gig economy" reflects the shift from a Fordist to a post-Fordist mode of accumulation. Jobs are fragmented into outsourced tasks, and wages are dismantled into micropayments (Casilli 2025, 30; Gray 2016). The activities that were once situated outside the formal spaces of capitalist expropriation—what traditional Marxist scholarship has relegated as hidden and supplemental work—have become the primary sites of value accumulation in the new financialized economy of life (Tadiar 2022).[1] Turkers make means of life—money, food—out of means of life—bodies, time, sociality. In the words of Jeff Bezos, the Amazon Mechanical Turk "is basically people-as-a-service" (Bezos 2006; Jones 2021; Prassl 2018). The forced flexibility, temporariness, and minimal compensation of crowdsourced AI work exemplify the type of "readily available and eliminable" labor required by post-industrial modes of production (Dyer-Witheford 2015, 74; Standing 2021, 38; Tadiar 2022, 118; Vora 2015). With no job security nor even federal wage regulations—since the Mechanical Turk pays workers by tasks and not by the hour (Hitlin 2016, 8)—workers are called upon and disposed of as needed, meeting the speed of capital circulation's demand and absorbing risks with their disposable life-times.

Panoptic segmentation, first proposed by Kirillov et al. (2019), unifies semantic segmentation and instance segmentation (Figure 2). Visual recognition algorithms operate along the dichotomy of "things" and "stuff," the prior referring to countable objects such as people and animals, while the latter refers to "amorphous regions of similar texture or material such as grass, sky, road" (Kirillov et al. 2019, 9404). Whereas instance segmentation focuses on the distinction between different instances within the same object class, prioritizing "things," semantic segmentation, in assigning a class label to every pixel, addresses both things and stuff, though usually without greater specification of instances. Panoptic segmentation encompasses both stuff and thing classes without losing sight of instance individuation. Krillov et al. write that, "the definition of 'panoptic' is "including everything visible in one view'; in our context panoptic refers to a unified, global view of segmentation" (9405). Krillov et al.'s use of the term calls to mind Foucault's writing on the panoptic schema, whose strength is that "it never intervenes, it is exercised spontaneously and without noise" (1995, 206). It acts directly on individuals, giving "power of mind over mind," and "assures its efficacy

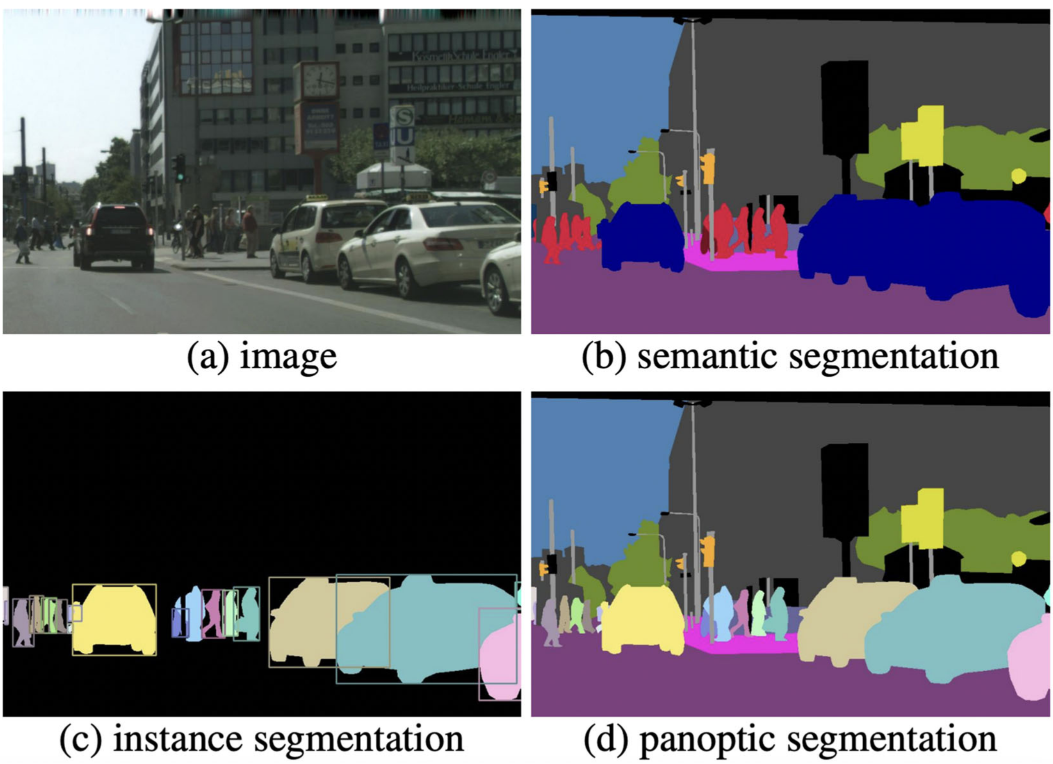

Figure 2. Distinctions between semantic segmentation, instance segmentation, and panoptic segmentation. Alexander Kirillov et al. "Panoptic Segmentation," 9404.

by its preventative character, its continuous functioning and its automatic mechanism" (206). If for Bentham, the panopticon gestures to a mode of seeing without being seen, for Foucault, the crux of the panopticon lies not with the unidirectional managerial gaze from the center, but with the prisoners, who are affected by a ubiquitous form of institutional power. Foucault is less concerned with an "all-seeing or all-registering eye" than he is with a "landscape that could at any time impart in an individual a likelihood of surveillance" (Elmer 2012, 24). For Deleuze, Foucault's disciplinary mechanisms, which operate through an internalization of power, laid the groundwork for a society of control with the ability to infer or anticipate. In a society of control, disciplinary society's molds and enclosures are replaced by self-deforming modulations, which have rapid rates of turnover, but are continuous and without limit (Deleuze 1992, 4, 6). In the computational age, these modulations operate at a subperceptual level—spontaneous and without noise, as Foucault cautions—and control individuals ceaselessly and automatically without the need of capture.

Panoptic segmentation's subperceptual management of daily life is inextricable from its militaristic pinpointing and elimination of enmity. As Inderpal Grewal writes in *Saving the Security State*, "the media economy of surveillance is also an economy that manages insecurities" (2017, 24). The ultimate targets of panoptic segmentation's pervasive and anticipatory classifications are the "insurgents" who challenge and who refuse to be contained by neoliberal security states. In a literature review of the latest developments and applications of panoptic segmentation in 2021, Omar Elharrouss et al. write that "increasing interest" and "new application opportunities are emerging" in the military sector (24), "where panoptic segmentation can be utilized to visualize hidden enemies on battlefields" (13). Xia Hua et al. (2021) likewise note that panoptic segmentation and its capacity for automatic recognition has a "wide application prospect in military and civil fields." Jeany Son and Soyeon Lee propose the use of panoptic segmentation to "expose hidden enemies in complex scenes" (2021, 291), creating a segmentation-guided image completion architecture based on GAN to "recover occluded parts of targets" (291; Figure 3).

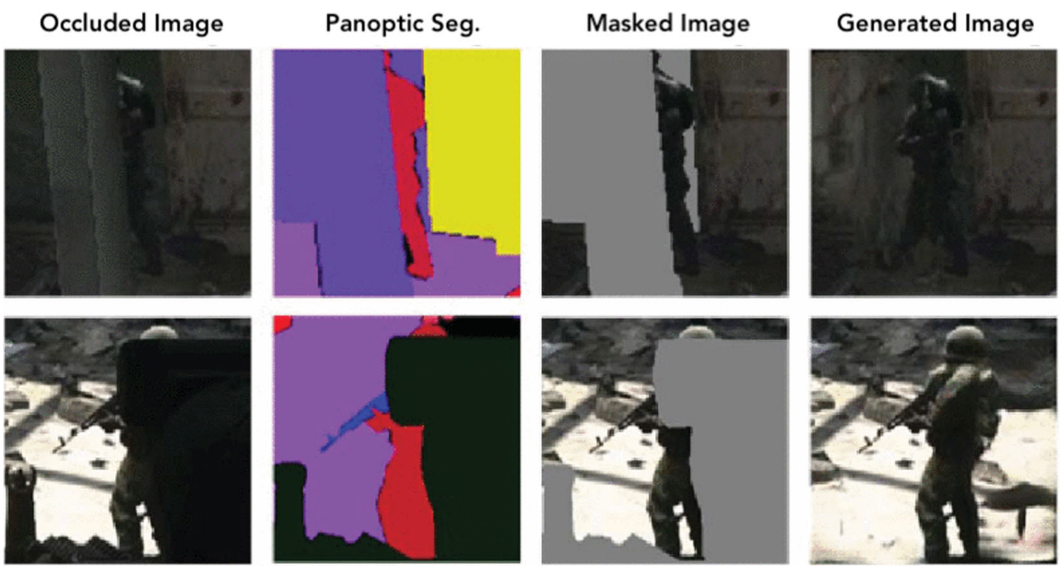

Figure 3. Segmentation-guided recovery of occluded enemy body parts on the Battlefield4 dataset. Son and Lee, "Hidden Enemy Visualization Using Fast Panoptic Segmentation on Battlefields," 291.

Son and Lee write that "since most enemies hide their bodies by cover and concealment, it is much harder to detect them"; at the same time, "scene understanding becomes more challenging due to complex, drastic challenges in battlefield environments, and it is easy to fail to recognize target objects" (291). They report that their image completion networks "successfully parsed the battlefield scenes and detected enemies and their occluded parts," and have the potential to "combat against fear and unrest" (294). Chang-Eun Lee et al. built upon Son and Lee's research and put forth a real-time panoptic segmentation network that can expose "hidden enemies in complex scenes" (2023, 6044), using a Pluralistic Image Completion network (PICNet) to reconstruct occluded parts of enemy targets (Figure 4). They highlight the applicability of their "intelligence-based real-time battlefield situation recognition technologies" to "actual battlefield environments" and combat training simulators (Lee et al. 2023, 6066). They anticipate that their models will become key technologies in the defense sector and in "intelligent security/crime prevention" (6066). In addition to the unrelenting visualization of camouflaged enemies, panoptic segmentation has also enhanced the analytic capabilities in remote sensing and satellite image processing. With its multi-task architecture that segments not only by class but also by instance, panoptic segmentation at once identifies planes, ships, oil tanks, etc., and recognizes subtle distinctions among subcategories of objects—specifying precise types of vehicles (Zhao et al. 2024). In analyses of satellite images of land, panoptic segmentation can identify different crop types and calculate yields

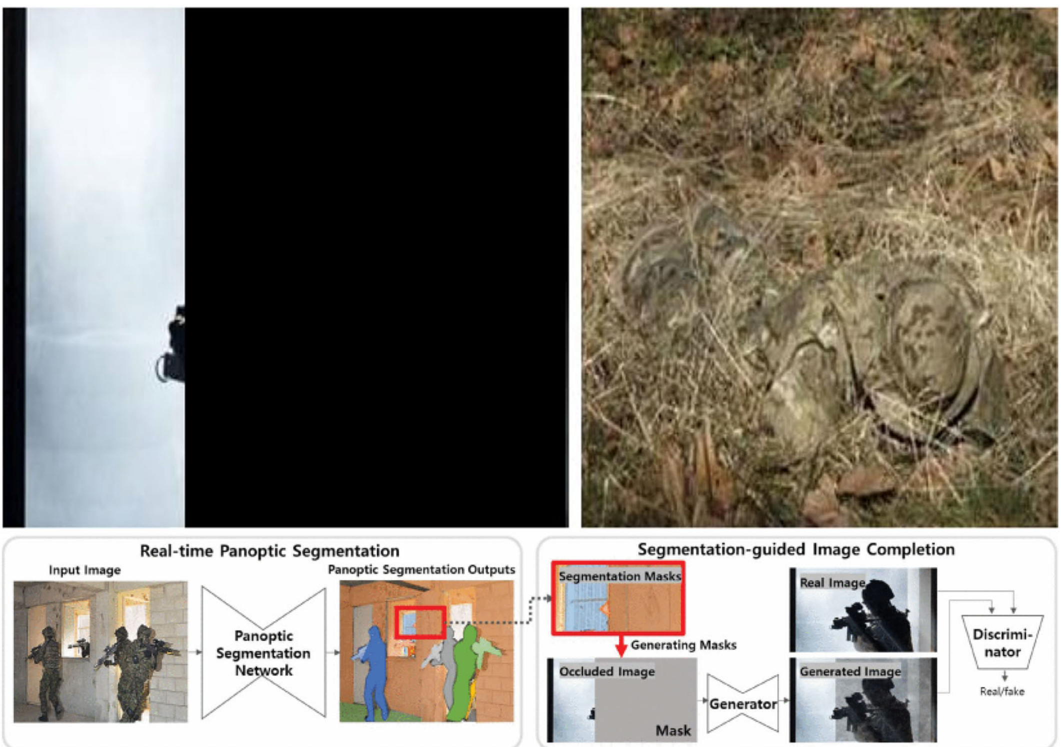

Figure 4. "Invisible enemies" due to concealment, and panoptic segmentation and segmentation-guided image completion frameworks used in Son and Lee (2021) and Lee et al. (2023).

across parcels of land (De Carvalho et al. 2023) and can gather advanced intelligence on individual households and road conditions (Fernando et al. 2023). As Danpei Zhao et al. write, panoptic segmentation is crucial in "disaster loss assessment and military surveillance" (2024, 3). In September 2024, the US Department of Defense's Research and Development Center awarded $200,000 to the Texas A&M Engineering Experiment Station to advance "panoptic segmentation for site characterization and object classification" (Federal Procurement Data System 2024). The development of panoptic segmentation is motivated by the militaristic pinpointing of enmity. The iPhone camera's panoptic segmentation architecture is erected upon expendable lifetimes, from the piecemeal workers who annotated the datasets that form its base model to the enemy targets whose elimination motivates its increasing precision.

LiDAR

The unrelenting enhancement of segmentation, which leaves no hiding, in conjunction with the integration of LiDAR scanners in iPhone 12 in 2020—a Light Detection and Ranging scanner that creates depth maps by measuring the time that light takes to hit an object's surface and bounce back to the detector—have turned every photographic occasion into a series of complex computational events with the aim of prediction, monitoring, and intervention (Apple Inc. 2022; Belisle 2023; Parikka 2023). Beaming millions of pulsing light bursts per second across the environment, the LiDAR device generates a map of the surveyed area known as a 3D point cloud (Shekhar and Vold 2020, 77). Individual points in the point cloud contain information such as 3D coordinates, the density and material composition of the object, RGB color values, and time stamps. Recent research (Chakravarthy et al. 2025; Fong et al. 2021; Marcuzzi et al. 2023; Zhang et al. 2023) in improving spatial understanding of autonomous vehicles has sought to perform panoptic segmentation of 3D LiDAR point clouds, classifying each point in the point cloud by "thing" and "stuff" classes (Figure 5). Although commercial depth sensors like Microsoft Kinect and Intel RealSense have been available for more than a decade (Baruch et al. 2022; Munaro, Basso, and Menegatti 2016), Apple's use of LiDAR sensors makes high quality RGB-D data "accessible to millions of people on a device they commonly use" (Apple Inc. 2022). If Kinect sensors and RealSense depth cameras have been used for advanced situational training by the US Army Research Laboratory (Daly 2014) and to detect moving objects around the Korean Demilitarized Zone (Warren 2014), Apple is the latest patron of RGB-D data-based action recognition. iPhone cameras share in the spatializing capacities of autonomous vehicles, perpetually generating 3D point clouds and ensuring that people are "better tracked" and

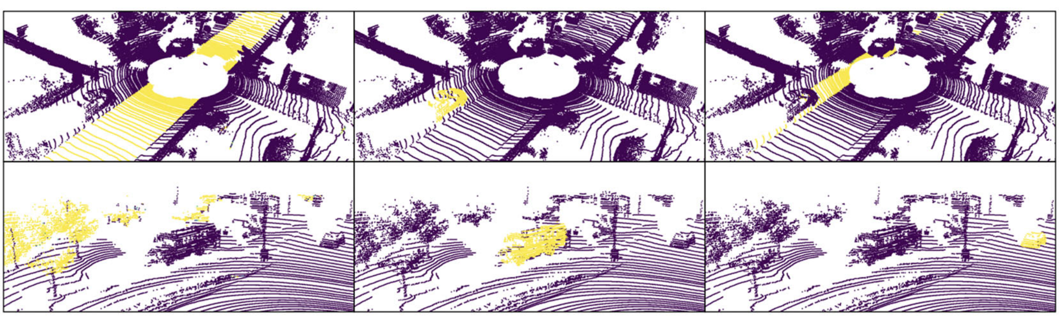

Figure 5. Mask proposals of "thing" instances and "stuff" classes on LiDAR point maps. Marcuzzi et al. "Mask-Based Panoptic LiDAR Segmentation for Autonomous Driving," 8.

"continuously detected" (Munaro, Basso, and Menegatti 2016, 536; Shaikh and Chai 2021).

LiDAR's emergence is tied to the military's reconnaissance and spatial mapping efforts. Akin to the optimization of panoptic segmentation, military-funded research has been at the forefront of innovations in the field of spatial computing (Bousquet 2018, 109). Laser range finders, deployed since the 1960s for the continuous tracking of mobile targets, were replaced by LiDAR, which generated 3D models of surveyed scenes with a resolution superior to that afforded by radar (Bousquet 2018, 74–75). LiDAR sensors that were first mounted on aircrafts to map and to monitor land are now used in unmanned aerial vehicles (UAVs) for intelligence and defense purposes (Shekhar and Vold 2020). Equipped with remote sensors for optical, infrared, and radar imaging, UAVs like the RQ-4 Global Hawk can survey up to 100,000 square kilometers during a single day of uninterrupted flight (Bousquet 2018, 102). As Antoine Bousquet writes in *The Eye of War*, LiDAR's "ultimate promise is to weaponize light itself" (79). If light is described as the "sun's pencil" in analog photography (Wynter 1863), LiDAR twists it into a martial medium—beams of photons that fix objects in a point cloud, informing on the target's coordinates and composition, rather than its visual outline.

Theorists of media and technology from Bousquet to Parikka use LiDAR as evidence of photography's pivot from the visual to the invisual—proof that "the pencil of nature" has given way to neural architectures that capture non-optical data (Parikka 2023; Toister 2024). As Adrian Mackenzie and Anna Munster write: "the visual itself as a paradigm for *how to see and observe* is being evacuated, and that space is now occupied by a different kind of perception" (2019, 6). Present forms of observation are part of "operative ontologies" (Parikka 2023, 33), which do not focus on the act of seeing at the site of the body of the perceiver, but in "connected networks where multiple feeds are part of the dynamic formation of an image in real time" (188). Parikka (2023, 188) notes that the pulse operating in LiDAR images is a "good conceptual route to understanding" the constant background modelling of space and action that has taken the place of earlier conceptualizations of photography as an image formed of a singular shot. Replacing the concern with *what is sensible to the phenomenological subject* are questions of what the sensors map and perceive or what the CNNs predict and doctor. Computational photography traffics in "operative images," which, according to Harun Farocki's definition, do not simply "represent things in the world," but "'do' things in the world" (2004, 17). What are we to make of photographs that are better characterized as an aggregate of RGB-D data or pixel-by-pixel composites of classifications? When what we understand to be a photograph is no longer an index or a mechanical reproduction of reality but the predictive sum of previous acts of naming, a 3D point cloud that tells on us even while we are in hiding, and neural networks that preformat our perceptual present with its "real-time" alterations, the coherence of phenomenological subjects suffers a breakdown. The imaging techniques of computational photography, which "depend on invisible, micro-temporal processes that are categorically outside the window of human perception" (Denson 2023b, 30), undercut and undo the correlation between the perceiving subject and the pictured world. I focus on the crisis of the phenomenological subject, as opposed to the liberal subject, to draw attention to how novel technological circumstances reconstitute embodiment, and, a fortiori, subjectivity. Invisual technologies exercise control at the level of prepersonal embodiment and subperception, prior to individuation (Denson 2014, 182; Denson 2020, 61; Merleau-Ponty 2002, 92).

The phenomenological subject in crisis

This transition from a photographic ontology to the "computational microtemporality of post-cinematic screens and networks—to the super-fast, real-time processing of images in a digital media ecology"—has been the source of considerable anxiety among critics, theorists, and viewers, as Shane Denson notes in *Discorrelated Images* (2020, 153). Denson argues that the new processuality of images, from digital production processes to compression algorithms to network protocols, unmoors integral phenomenological subjects who, in a photographic media regime, could regard images as more or less fixed objects. If photography, developed in the nineteenth century, commemorated or mediated individual deaths, and cinema reanimated photography's death-borne traces, post-cinema, according to Denson, "discorrelates the hyperanimated image from human perception" and disperses it "environmentally at sub- and supra-personal levels, and in this way anticipates, premediates, and/or commemorates mass extinctions" (196). Intimating the eradication of human perception, post-cinema imagines a time after extinction even before extinction takes place. It envisions a world without human users, a world beyond correlationism, and a world that we to some extent inhabit already. This is the world of autonomous machine perception that Paul Virilio theorizes in *The Vision Machine*, where "instrumental virtual images" have realized a "prosthesis of automatic perception" (1988, 126)—a machinic imaginary that completely excludes the human subject from the decision-making process.

In "The Scene of the Screen," Vivian Sobchack also discusses the crisis of the lived body in the passage from photographic to electronic media. For Sobchack, photography's rise in the second half of the nineteenth century—during a "frenzy of the visible" and the period of market capitalism—meant that photography was linked with the subjective activity of visual possession (Comolli 1980, 122; Sobchack 2016, 96–97). Photography is imbricated with the material possession of traces of the "real world" and the ability for this possession to multiply through mechanical reproduction—its colonial logic and centrality to imperial efforts are discussed at length by scholars from Ariella Azoulay to Nerissa Balce (Azoulay 2021; Balce 2016; Pinney 1997; Sobchack 2016, 98). Whereas "the photograph's existence as an object and a possession with fixed yet increasing value materializes and authenticates experience, others, and oneself as empirically real" (Sobchack 2016, 98), electronic technology engages its users in a phenomenological structure that "seems so diffused as to belong to no-body" (104). For Sobchack, the electronic is phenomenologically experienced not as a "discrete, intentional, body-centered mediation and projection in space" but as a "simultaneous, dispersed, and insubstantial transmission across a network or web that is constituted spatially more as a materially flimsy latticework of nodal points than as the stable ground of embodied experience" (110–111). The photographic assurance of the material possession of the world and self is displaced by an electronic dispersal of embodied experience. If the photographic contract establishes subject-centric or ocular-centric correlation, computational media maintains that "point of view is not necessary for seeing" (Galloway 2021, 53).

Sobchack's analysis of (dis)embodiment in the electronic age portends a "technological crisis of the flesh" (2016, 119) and spells an end to the phenomenologically understood world. In her Jamesonian framework, the "postmodern and electronic instant"—in its flattening of time—breaks from modernist temporal structures and constitutes a form of "*absolute presence*" that evacuates the "lived body's material and moral gravity" (115). The effacement of the sovereign user in the face of micro-temporal computation has only accelerated since Sobchack's writing. As computational processes vastly outpace human decision-making, they predict our behavior, pre-visualize our interactions, and pre-format our thinking. The dissolution of the subject is concurrent with predictive and counterinsurgent policing. Algorithmic operations anticipatorily modulate the process of subjectivation and standardize the users' perception according to hegemonic precepts of race, gender, sexuality, ability, and class (Denson 2023b, 227). In quoting Sobchack at length about the lived body in crisis and the discorrelation of the phenomenological subject, I do not mean to induce technological fatalism, nor to come to humanism and analog photography's defense. Rather, I'm interested in how the smartphone user's disembodiment might open onto a shared struggle with people who have been the constitutive underside of the phenomenological subject and who remain the target or the expended surplus of AI empire.

How would Sobchack's account of photographic and electronic perception read from the perspective of the colonized? While imperial photography produces colonized subjects through its possessive logic and temporal lag—where the force of nostalgia commemorates an extinction that has not yet but is bound to take place, and where the photographic temporality of "that-has-been" inscribes a backwardness or pastness upon the colonized—in the absolute presence of electronic or computational time, the colonial subject is interpolated and prefigured as target, automatically put on a kill list. In other words, extinction has long taken place and continues to take place daily for colonized people. The eradication of human perception and the bypassing of human decision in favor of algorithmic calculations, so feared by phenomenological subjects, has been the lived reality of those classified under the proscribed category of N.H.I., "no humans involved" (Wynter 1994, 65). Paul Virilio's machinic world is not so much a dystopian future as it is an illustration of a colonial situation: the global Poor and Jobless, les damnés, and Black and brown people racialized as insurgents are always hailed by categories not of their own choosing; their dissimulation and annihilation are preformatted into Western onto-epistemological systems' ground truth.

Liberal anxiety around automated perception stems from a repressed familiarity with the brutality of predictive policing, which determines guilt prior to the fact of crime, bombs for "deterrence" (Abraham 2024), and pre-identifies "terrorists" based on "pattern of life" (Shaw and Akhter 2014, 227). The Chicago Police Department produced a "Strategic Subject List" that targeted people whose profiles, neighborhoods, and acquaintances resembled those of previous gun victims (Chun and Barnett 2021, 18). While the "Strategic Subject List" program was terminated in 2019, most US police departments continue to use computerized statistics (CompStat) managerial programs that predict crimes based on past patterns—automatically perpetuating racialized persecution and discipline (Shapiro 2017). Ruha Benjamin describes these technologically mediated forms of insured punishment as the "New Jim Code" (2019, 5). Cathy O'Neil calls these predictive programs that turn race into a recursive death trap "weapons of math destruction" (2016), and Safiya Umoja Noble pinpoints them as "algorithms of oppression" (2018). Not only is criminality predetermined in predictive policing, but the automation of a sensor-shooter link and the elimination of an enemy based on an electronic pattern of life has also been instituted as early as Operation Igloo White in 1968. The human at the end of electronic warfare is dissimulated as a "target signature." As Ian Shaw writes in *Predator Empire*, "individuals became metaphors, worms that wiggled on a screen and then vanished" (2016, 88). Increasingly, in technological warfare, "pattern of life" analysis based on video feeds, email, social media becomes reason enough to kill. These information patterns are processed through algorithms for social network analysis to produce what Joseph Pugliese calls a "pattern of death" (2013, 193; Wilcox 2017, 16). If algorithmically generated kill lists are usually "manually" checked for accuracy by intelligence personnel, in the war in Gaza, Lavender's kill lists have been automatically approved and adopted (Abraham 2024). Lavender, developed by the Israel Defense Forces' elite intelligence division, Unit 8200, is used to process metadata to rapidly identify "junior" operatives to target. As commanders demanded a continuous pipeline of targets, the dragnet of Lavender was adjusted to generate as many as 37,000 Palestinian men "affiliated" with Hamas and the Palestinian Islamic Jihad (McKernan and Davies 2024). Algorithmic systems suit the necropolitical desire for elimination and buttress it with an air of objectiveness. What leads phenomenological subjects to fear the "subordination of everything to impersonal logic and to the reign of calculability" is their keen awareness of the persistence, ongoing enactment, and acceleration of the "*becoming-object* of the human being" (Mbembe 2003, 18).

To be more precise, phenomenological subjects know that "continuous surveillance, the exploitation of material and immaterial labor, sensory capture, and recording of biological and social process" (Tacheva and Ramasubramanian 2023, 3) have always existed as mechanisms of domination. However, in the computational age, which is also the age of neoliberal security states, phenomenological subjects have also been datafied and fed to these classificatory and predictive systems for behavior control and engineering—exposed to a discorrelativeness with which the colonized are familiar. Military technologies previously used to target racialized enemies have been commercialized and re-distributed into everyday life in the metropole. The martial gaze is inescapably cast on domestic societies, which are "increasingly conceived as battlespaces in potentia," requiring "persistent and intensive surveillance for the purposes of preempting, deterring, and neutralizing emergent threats" (Bousquet 2018, 193). As Stephen Graham argues in *Cities Under Siege: The New Military Urbanism*, welfare states are being "re-engineered as risk-management systems, geared not towards social welfare of communities but toward controlling the location, behavior, and future of seemingly risky 'anti-citizens"' (2011, 94). According to this counter-insurgent worldview, "innocent civilians" always have the potential to become insurgents (Etzioni 2010, 69), and enemy combatants are impossible to tell apart from civilians (Defense Science Board Summer Study 2004)—an indiscriminateness that justifies perpetual and comprehensive securitization. Cellphones and their classificatory architectures and spatial mapping participate in this constant anticipation of danger and indefinite management of risk. The technocratic counterinsurgent state advances a "preemptive culture of techno-security" that targets everyone and everything, everywhere and all the time (Reichborn-Kjennerud 2025, 152; Weber 2016, 118). It pervades the everyday and produces endless possible future enemies to forestall "unknown unknowns" (Massumi 2015, 10; Rumsfeld 2002). The military origins and affiliations of panoptic segmentation and LiDAR demonstrate iPhones' implication in the securitization of daily life and our subjection to automated control systems.

A sociality of no-bodies

How can the phenomenological subject's "crisis of the flesh" open onto an intimacy and shared struggle with those deemed wastable by the US' sensorial empire and state of permanent war? My quotation of Sobchack's phrase is not intended as a coy or uncritical conflation of her use of the term and Hortense Spillers' theorization of the flesh as the "zero degree of social conceptualization" (1987, 67). As Rizvana Bradley parses in *Anteaesthetics*, flesh in Merleau-Ponty's late work is the "elementary, precommunicative domain out of which both subject and object, in their mutual interactions, develop" and the "(im)proper belongingness of the subject to the world and the world as the condition of the subject" (2023, 92), while flesh in Spillers and Bradley's conception emphasizes:

> The history of flesh within modernity is in fact inseparable from both the racially gendered displacement of flesh through the dissimulation of the 'black body,' and the violent (re)productivity of black feminine flesh that functions as the medium of this displacement. It is the sequestration and concealment of fleshly exorbitance through the dissimulation of the 'black body' which enables the conceit of the subject who belongs to the world and for whom "the world remains isomorphic." If Merleau-Ponty and his followers can invoke a universalist idiom of human flesh as "invaginative," it is only because the black feminine has already encountered flesh as abyssal. (Bradley 2023, 92)

Although in both Merleau-Ponty and Spillers' framework, flesh is anterior to individuation and gestures to the state of corporeal entanglement that precedes and exceeds the relay of subject, object, and world, Spillers and Bradley stress that phenomenology is "unable to think the enfleshed existence of blackness that is the body's condition of (im)possibility" (Bradley 2023, 88). Flesh can only appear as "phenomenology's exhaust and exhaustion" (Bradley 2023, 93; Moten 2018, ix). If for Sobchack, the "crisis of the flesh" can be substituted with "the crisis of the lived body," Bradley maintains that "black people are no-bodies, given to an enfleshed existence which the body as racial apparatus can neither escape or completely subsume" (2023, 87). What would it mean for the Merleau-Pontian notion of the flesh to recall Spillers and Bradley's theorization of the flesh, even as one acknowledges their distinctions? The Merleau-Pontian flesh in crisis remembers the black enfleshed existence that is the condition of the phenomenological subject's emergence because the counterinsurgent world has made dissimulation—the violent rend(er)ing of flesh as a computable, identifiable, and expendable body—their shared condition.

Can we reformulate Sobchack's lament that electronic media engage users in a phenomenological experience that seems "so diffused as to belong to no-body," by way of Bradley, into a call for a sociality of "no-bodies"—the only way that we might survive in this counterinsurgent world, with its pervasive, predictive military technologies? Can the phenomenological subject's exposure to disembodiment in the face of micro-temporal operations serve as a glimpse into the proscriptive position that the targeted damnés have always occupied?[2] Necropolitics and the subperceptual right to maim are nothing new for the colonized; the death-dealing impulse has remained continuous across analog and computational photography. Both visual and invisual media are implicated in the "foundationally anti-black metaphysics of the modern world" (Bradley 2021; Brown 2024) and the security state's aim to eliminate insurgency—the imperial code for the expendable's fight for survival (Tadiar 2022). "We need to hear the call of the rightless, for they know what the future holds," warns A. Naomi Paik (2016, 230) in her study of the legal production of rightlessness—the judiciary backing for extra-judiciary violence like black box sites and torture. The two notions of the flesh bump into each other in a counterinsurgent world, because every smartphone user is a new potential site of targeting under the military-security-industrial complex. It is by siding with the damnés that phenomenological subjects save themselves, too, from the increasingly precise systems of movement detection and facial recognition, evermore panoptic models of segmentation, point clouds that leave no hiding, and automated kill lists that constantly expand the scope of "terror." If, as Jasmina Tacheva and Srividya Ramasubramanian note, the microtemporal algorithmic networks are only the latest technologies of "heteropatriarchy, racial capitalism, white supremacy, and coloniality"'s aims of classification, prediction, and extraction, how might we engage in a shared struggle with those who have always been the horizon and effluence of these systems? Might the discorrelation of the phenomenological body be an entry into a more fundamental overturning of necropolitical systems that seek to rend(er) indeterminable flesh into classifiable bodies and to generate profit by laying "insurgent" populations to waste?

In drawing out the militarized substrate of a practice as commonplace as iPhone photography, I hope to link the subperceptual and prepersonal discorrelation of the smartphone user with the low-paid microworkers and the racialized enemy combatants who are not only the expended underside of neoliberal security regimes, but also the excluded condition of possibility of the phenomenological subject. As iPhone users are mapped and pre-formatted by algorithmic processes that radically outpace their perceptual capacities, I argue that the dissimulation of the decision-making subject need not equate to a disinvestment from ethics and politics but to their reformulation. Rather than a conception of ethical action that assumes an "unequivocal I" as its precondition (Amoore and and Others 2020, 8; Butler 2005, 19), the phenomenological subject's dissimulation opens onto a terrain of shared struggle between the discorrelated smartphone user and the "insurgent" targeted for maiming. Dispelled of an investment in individuated subjectivities—what Bradley describes as the site of flesh's violent inscription and rendering—this sociality of "no-bodies" offers a framework of ethical responsibility that does not need an integral and proscriptive "I" as its subject. While invisual technologies operate at microtemporal scales to undercut users' capacity for moral action, phenomenological subjects can, by virtue of their dissimulation, bypass the preciousness of individuation and practice solidarity without recourse to separability or the classification of difference. "Civil contract" (Azoulay 2008) in the time of computational photography and subjectivity's bankruptcy manifests as a shared struggle of no-bodies—an alliance between smartphone users, exploited microworkers, and racialized enemy targets that exceeds the interpolation of a capitalist racist and counterinsurgent world (Burden-Stelly 2023, 15; Moten 2013).

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Notes

1. Barely considered workers, piecemeal workers employed through the Amazon Mechanical Turk are usually described as a source of caption- or label-generation. When Xinlei Chen et al. sought to create a Microsoft COCO Caption dataset, they write that their captions were "generated using human subjects on AMT." The human subjects were also instructed to "not describe what a person might say" when they generated captions based on "important parts of the scene" (2015). A category of labor that falls outside of Marx's notion of the worker, Turkers were explicitly precluded from personhood and reduced to the "microtasks" they can flexibly fulfill, according to a post-Fordist mode of accumulation.
2. This is not to say that smartphone users and racialized enemy targets are mutually exclusive categories. The same person can be the target of both the smartphone's microscale pre-formatting of perception and the counterinsurgent state's macroscale persecution. The question is a call to the billions of smartphone users globally to consider the militaristic substrate of an act as mundane as taking a photograph on the cellphone. It is also a reminder of the solidarity that smartphone users—subject to subperceptual modulation and policing—must forge with racialized "insurgents" who are the raison d'être behind the counterinsurgent state's continual enhancement of invisual technologies and its increasingly precise pinpointing of enmity.

ORCID

Ekalan Hou http://orcid.org/0009-0009-2357-8925

Ekalan Hou is a PhD candidate in History of Art and American Studies at Yale University. Her research focuses on photography and US counterinsurgency.

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