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IJoC Media, Hot and Cold

Drones, Infrared Imagery, and Body Heat

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For decades, planes and satellites have remotely sensed the earth's surface, transforming objects and sites into temperature data. Over time, this data has been used to understand the thermal properties of material phenomena and to generate heat signatures for objects ranging from nuclear power plants to glaciers. Within this planetary regime, the earth has been codified as a set of absolute temperature values such that military strategists, meteorologists, and earth scientists have built careers on perceived repetitions, variations, and/or anomalies in these values. In the current world order, temperature taking usually precedes decision making, and officials have invested enormous faith in the capacities of sensing instruments tasked to "see" electromagnetic radiation that is imperceptible to humans.

In recent years thermal infrared sensors have been loaded onto unmanned aerial vehicles or drones, which fly at lower altitudes than planes and satellites and can hover over particular sites for extended periods, yielding high-resolution imagery. The Predator and Reaper drones used in U.S. counterterrorism and targeted killings are equipped with infrared sensors that enable remote pilots to monitor and track heat-bearing objects on the ground in real time. As drones fly above territories, their instruments "see" through clouds and darkness and sense infrared radiation emitted from objects on the earth's surface. Once this radiation is detected, it is encrypted and converted into data and transmitted to earth stations where it can be processed by computers and rendered as rasterized displays that correlate pixel qualities with temperature values. FLIR, one of the world's largest manufacturers of infrared instruments, boasts that its infrared cameras are designed to "to show a thermal world not visible to the unaided eye."

In addition to being used for general aerial reconnaissance, infrared imagery is used to monitor, track, and target—or, in the parlance of U.S. special operations, to "find, fix, and finish"—particular sites, objects, or bodies on earth. In such contexts, infrared imaging reorganizes the visual field as a hunt for heat, and the "drone stare" is fixed on heat-bearing objects such as guns, missiles, explosives, tanks, antiaircraft vehicles, trucks, power generators, and people (Wall & Monahan, 2011). During the past decade, infrared imagery has been used to locate and kill Osama bin Laden and Anwar al-Awlaki as well as thousands of alleged terrorists and civilians in Pakistan, Yemen, and Somalia. In the United States, law enforcers have used airborne thermal infrared sensors to patrol U.S. borders, bolster urban and rural policing, and find and apprehend Boston bombing suspect Dzhokhar Tsarnaev.

In such situations, aerial systems are calibrated to detect and visualize infrared emissions such that human bodies pop out in the visual field as blotches of light or dark stasis or movement (depending on image processing selections). As such, bodies are not only easier to see, but easier to track and target. Within this visual regime, surveillance practices are extended beyond epidermalization (Browne, 2010;

Fanon, 1967), personal information gathering (Lyon, 2002), and biometrics (Gates, 2011) as infrared imagery isolates suspects according to the heat waves emitted by their bodies. While other systems of human differentiation and observation are organized around skin color, personal data, and/or facial recognition, aerial infrared imagery turns all bodies into indistinct human morphologies that cannot be differentiated according to conventional visible light indicators of gender, race, or class. Seeing according to temperature turns everyone into a potential suspect or target and has the effect of normalizing surveillance since all bodies appear similar beneath its gaze.

At the same time, however, it is important to point out that temperature data have become visible precisely so that they can be made productive within existing regimes of power. Even as it displaces the visible light registers of ethnic/racial difference, drone-based infrared imagery reinforces already existing power hierarchies by monitoring and targeting certain territories and peoples—such as those in Pakistan, Yemen, Somalia and along the U.S.-Mexico border—with greater frequency and potency. These areas are designated as geopolitical "hotspots" that need to be pre-emptively contained. Strategies of ethnic/racial differentiation do not disappear within an aerial system of temperature-based visuality; rather, they are restructured along a vertical axis of power and recodified through systems of social sorting, remote sensing, and computational imaging. Certain peoples' territories, movements, and profiles are scrutinized, tracked, and targeted from the air day after day, month after month, year after year. As drones circle above, they reorganize surveillance as the aerial harvesting of body heat and movement, which not only alters peoples' everyday dispositions to the sky, but also produces vertical affects such as intimidation, fear, rage, revenge, injury, and death. Surveillance, then, shifts from a system of decoding the visible markers of difference on individual bodies to one that uses body temperature data to differentially apply vertical administration.

Perhaps what the thermal image ultimately reveals is how deep the compulsions of extraction and control run and how forcefully they need to be staged and reasserted. Though infrared imagery encodes light or dark blotches as "hot," it is important to point out that these images are not "heat photos." They are computational images or data visualizations. As Alex Galloway explains, "any visualization of data must invent an artificial set of translation rules that convert abstract number to semiotic sign" (2012, p. 83). Because of this, he continues, "any data visualization is first and foremost a visualization *of the conversion rules themselves*, and only secondarily a visualization of the raw data" (ibid.). If this is true, what are we really looking at when viewing infrared imagery? The thermal image is not only a visualization of an algorithm (assuming this is what Galloway means by conversion rules); it can also be understood as rendering more macrolevel *conversion rules* such as the implicit mandate of science and militarism to transform the imperceptible into a rubric of human experience and the body into a target.

These conditions suggest the need for further historical and critical investigation into what Jeremy Packer calls the "radiographic episteme," which he describes as "all that can be known through the reflective conditions and characteristics of radio waves and the environment" (2013, p. 189). Studying the "radiographic episteme" would involve exploring the detection systems, knowledge formations, communication practices, and mediations that have taken shape in relation to a broader range of the electromagnetic spectrum, beyond that of visible light. Work on such a topic requires engaging with the

tensions between visibility/invisibility as well as the dynamics of camouflage that Hanna Rose Shell (2012) eloquently elaborates in *Hide and Seek*. It also involves considering the different types of media analytics and deliberative practices that have historically emerged within intelligence agencies (Hinsman, 2014). Engaging critically with a broader range of the electromagnetic spectrum and radiographic episteme is bound to expose how contingent visualization is and has always been.

Just as practices of visibility/invisibility and racial/ethnic differentiation shift within a temperature-based visuality, so do tactics of resistance. A plethora of counter-thermal imaging practices has surfaced in recent years in response to increasing drone use, imploring people to do everything from relearn how to "bird watch" (code for watch for drones) to experiment with deflective and insulating materials—such as glass, wool blankets, rugs, tin foil, and synthetically designed fabrics—in efforts to trap or hide heat, even if temporarily, so that it cannot be detected when drones are hovering above. New York artists Adam Harvey and Johanna Bloomfield even released a drone-proof clothing line called Stealth Wear made of nickel metalized fabric, and a German company has designed a special outfit called Ghost, which makes the body invisible to infrared sensors. And while fashion designers, libertarian survivalists, civilians, and militants devise schemes and materials to evade aerial thermal infrared sensors, FLIR has just released the first personal thermal imager designed for smart phones. The antics of the thermal mediascape have just begun.

References

Browne, S. (2010). Digital epidermalization: Race, identity and biometrics. *Critical Sociology, 36*(1), 131–150.

Fanon, F. (1967). *Black skin white masks*. New York, NY: Grove Press.

Galloway, A. (2012). *The interface effect*. Cambridge, UK: Polity Press.

Gates, K. (2011). *Our biometric future: Facial recognition technology and the culture of surveillance*. New York, NY: New York University Press.

Hinsman, A. (2014). Undetected media: Intelligence and the U-2 spy plane. *The Velvet Light Trap*, *73*, 19–38.

Lyon, D. (2002). Everyday surveillance: Personal data and social classifications. *Information Communication & Society*, *5*(2), 242–257.

Packer, J. (2013). Screens in the sky: SAGE, surveillance, and the automation of perceptual, mnemonic, and epistemological labor. *Social Semiotics, 23*(2), 173–195.

Shell, H. R. (2012). *Hide and seek: Camouflage, photography, and the media of reconnaissance*. Brooklyn, NY: Zone Books.

Wall, T., & Monahan, T. (2011). Surveillance and violence from afar: The politics of drones and liminal security-scapes. *Theoretical Criminology*, *15*(3), 239–254.