Annotated Bibliography on UAS and the Arts

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ANNOTATIONS

Part A: UAS and the Arts
Part B: Methodological and Technical UAS tools for arts and humanities

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PART A: UAS AND THE ARTS

Bilal, Wafaa and Kari Lydersen. *Shoot an Iraqi: Art, Life and Resistance under the Gun.* San Francisco: City Lights, 2008.

An account of Wafaa Bilal's 2007 installation/performance "Domestic Tension" at FlatFile Galleries in Chicago, which was directly inspired by the death of his brother by a US Predator drone. In "Domestic Tension", visitors were invited to shoot paintballs at Iraqi native Wafaa Bilal, who had created a living space within the gallery the same size as a prison cell. People worldwide were also invited/allowed to 'shoot' Bilal via a remote controlled paintball gun that could be controlled online. The book intersperses accounts from Bilal's childhood in Iraq, his life in refugee camps, and his eventual arrival in the United States. Interwoven with these biographic accounts are narrations of his experiences as a target in "Domestic Tension", the psychological aspects of the performance, its impacts on him as an artist and as a person, as well as the various types of people with whom he interacted in the gallery and online for the duration of the month-long installation, which rapidly took on the trappings of a contained war zone. Bilal was the intended target, and by its conclusion, he was exhibiting signs of post-traumatic stress disorder (PTSD). Concurrently, opposing online communities formed, with some users coordinating to control the paintball gun so that it was pointed away from Bilal, and other individuals collaborating to ensure the maximum number of strikes on or near the artist. Bilal maintains an online archive of videos recorded daily over the duration of "Domestic Tension" at http://wafaabilal.com/domestic-tension/ (Accessed 26 July 2016).

Bishop, Ryan and John Phillips. "Strategies and Technologies of Containment: Containing the Political." *Modernist Avant-Garde Aesthetics and Contemporary Military Technology: Technicities of Perception*, Edinburgh: Edinburgh University Press, 2010, pp. 169-196.

UAS are mentioned somewhat in passing in this densely theoretical work, which focuses on a systematic deconstruction of human processes of perception, drawing on Duchamps, Derrida, Picasso, Joyce, and others alongside modernist and Romantic poets. UAS (referred to as Unmanned Combat Air Vehicles, or UCAVs) are emphasized in a discussion of mechanisms by which diaspora populations are intentionally de-humanized

and stripped of identities during UAS-executed military operations. Authors discuss how unmanned vehicles are employed to create—or attempt to realize—projections of "utopia" (171) through military action(s). By juxtaposing modern day UAS military actions with artistic/philosophical works produced in past epochs, the authors contrast the role that modernist aesthetics—and its attempts to explore the space between object and perception—plays in military operations versus its theoretical applications in the arts and humanities. UAS shift from simply viewing into an ability to execute deliberate, planned action(s), extending the UAS operator's body into virtual space and thereby pushing the boundaries of what constitutes physical action, "smart" technology, and the roles that an unmanned flying object under military control can have on perceptions and definitions of authority, risk, and observation, both by the operator and the 'target' populations.

Brighenti, Andrea Mubi, "Artveillance: At the Crossroads of Art and Surveillance." *Surveillance & Society* 7(2), 2010, pp. 137-148.

The primary questions addressed in this article are: how do artists address modern 'surveillance society' and what collective imagery results? Surveillance is defined as both the technical data acquisition processes and the creative set of techniques employed to get it. Artists can engage acts or techniques of surveillance as a point of discourse or commentary, or employ surveillance techniques themselves to create works. The author analyzes artists and their engagement with technology according to categories of three levels of visibility (recognition, control, and spectacle) and four types of recognition (categorical, individual, personal, and spectacular). As a level of visibility, recognition gives social validation and existence that empowers a subject. Control is defined as visibility that disempowers (e.g., 'God's eye view'). Spectacle is visibility beyond everyday life. Each of the four types of recognition corresponds to a specific mood and stimulates specific effects in the creative process.

Cauchard, Jessica R., Jane L. E, Kevin Y. Zhai, and James A. Landay. "Drone & Me: An Exploration Into Natural Human-Drone Interaction." UbiComp '15 Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing, ACM New York, NY, USA, 2015, pp. 361-365. doi>10.1145/2750858.2805823. http://dl.acm.org/citation.cfm?id=2805823. Accessed 19 July 2016.

This is an analysis of how humans interact with UAS, in particular how human behavior changes as people spend increasing amounts of time with UAS. Specifically, humans begin to employ gestures with the UAS that are the same as those used when interacting with pets and other humans, and engage more with the UAS as time goes on. The authors test a range of people interacting with UAS and found that most were initially hesitant to 'talk to' the UAS using verbal commands and preferred to rely on gestures. As they grew more comfortable, they became more willing to speak directly to the UAS, and concurrently became increasingly willing to allow UAS into successively closer physical spaces while demonstrating increasingly familiar modes of interaction with them. The

authors suggest that these results provide data as to how to design future UAS to be more 'approachable' and seen as less of a potential threat.

Delmont, Matt. "Drone Encounters: Noor Behram, Omer Fast, and Visual Critiques of Drone Warfare", *American Quarterly*, Vol. 65, No. 1 (March 2013), pp. 193-202.

The author draws on the photography of Noor Behram and a film installation by Omer Fast (*5000 Feet is the Best*) to critique the presentation of modern military uses of UAS as "surgical" and "precise", as well as further develop theories of visual culture in the 'war on terror' advanced by Melani McAlister in *Epic Encounters* (2001; second ed., 2005). Behram's photography seeks to highlight the results of UAS strikes by calling attention to the numbers of likely non-combatants, primarily women and children, who are killed in military action as well as the places and people that survive the incidents. Fast's documentary is a thirty minute long interview with a former UAS pilot juxtaposed with re-enactments of the content. Fast creates a sense of disconnect for a US-based audience by situating re-enacted scenes within the United States and using predominantly Caucasian actors while using audio that describes events abroad, an approach intended to "[question] the existence of safe civilian spaces" (198).

Greene, Daniel. "Drone Vision." *Surveillance and Society*, 13(2), 2015, pp. 233-249.

Greene postulates 'Drone Vision' as the techniques by which UAVs visualize and act upon the world. The author formulates a "new, imperial visual culture of war" in part through an analysis of the drone art of James Bridle and the satirical *Texts from Drone*. His approach is largely based on the process-oriented feminist materialism of Bennett (2009) and Barad (2007), specifically the concept of 'strategic anthropomorphism' as evidenced through drone-related popular culture, and he argues that anthropomorphic drone art "reveals that the technology is native to a particular form of violence." The author analyzes Bridle's works, in particular *Dronestagram* and *Watching the Watchers*, which emphasize the lack of violent content in the images—the lack of 'shock and awe' that the Western audience is largely conditioned to expect—rather than emphasizing how much the viewer does not know about these operations/sorties, the operators, and the intelligence that drives them.

Gschrey, Raul. "Contemporary Closed Circuits-Subversive Dialogues: Artistic Strategies against Surveillance." *Surveillance and Society*, Special Issue on Surveillance, Performance and New Media Art, edited by John McGrath and Robert Sweeny, 7(2), 2010, pp. 144-164.

Gschrey, a visual artist, explains his rationale, methods, and the challenges encountered in a series of works created between 2004-2009. Many of these were public installations that examined the rise of CCTV and surveillance, and sought to spark public dialogue about the prevalence of such electronics, specifically, through advocating "subversive strategies...[that] counter the inherent power relations of surveillance systems..." The

article documents the author's three-year final thesis project on this topic, executed in public spaces in Frankfurt, Germany and augmented through occasional gallery exhibitions. Though primarily oriented to CCTV, the artist is directly asserting a defiant role against the predominance of technology in public lives. The artist's motivations grew out of questions in 2004 regarding the function(s) of the cameras (providing security vs. offering observation) and what, if anything, happened to the images produced. The artist created a web map of the city, located surveillance apparatuses, and carried out projects in public space (http://www.pro-these.com/ffmap). For example, in *The Typical Frankfurter*, he compiles digital images of a given city's inhabitants and blends them to create a fictitious 'average' resident, all in order to circumvent and undermine facial recognition software. Gschrey's installation works invited guests to play the roles of observer and observed, and press boundaries regarding realization of individual agency for those in the 'observed' role. In his conclusion, Gschrey advocates for the development of collaborative "subversive strategies" created through interdisciplinary efforts.

Houston, Kerr. "Remote Control: Distance in Two Works by Emily Jacir and Wafaa Bilal." *Southeastern College Art Conference Review (SECAC),* volume XVI, number 2 (2013), pp. 189-196.

Houston analyzes the impact of proximity in two performance pieces by artists of Middle Eastern descent. Jacir's piece focused on Palestinians unable to access their homeland, and for the purposes of this project will not be discussed as it did not incorporate UAS in any way. Bilal's work, "Domestic Tension", was created as a partial response to the murder of his brother by a UAS strike at a military checkpoint in their native Iraq. Houston draws parallels regarding the distance between UAS operators and their targets with Bilal's installation in a Chicago-area gallery and his online 'hunters', and further, how technology-based interfaces impact perceptions of responsibility, agency, and empathy. Houston maintains that the unilateral nature of the interactions—wherein the targets are unable to respond to the aggressor(s)—impact the nature of modern military engagement and provide selective information to the public that then act as 'evidence' for a range of beliefs and perspectives.

Huffington, Arianna. "Drone Shadows." *Design and Violence*. New York: Museum of Modern Art, 2015, pp. 128-133.

Huffington's short essay is part of a larger exhibition catalog dedicated to James Bridle's ongoing installation series *Drone Shadows*. According to Huffington, the military uses of UAS are fundamentally dangerous, imprecise, and improperly studied. She views Bridle's installations, in which he places to-scale outlines of UAS in prominent public spaces, as catalyst for necessary—and from her perspective, overdue—conversations on UAS.

Lee-Morrison, Lila. "Drone Warfare: Visual Primacy as a Weapon." *Transvisuality: The Cultural Dimension of Visuality*. Volume II: Visual Organizations, edited by Tore Kristensen, Anders Michelsen and Frauke Wiegand. Liverpool: Liverpool University Press, 2015, pp. 201-214.

Focuses on the effects of visuality in military drone strikes, in particular the mediating role of the UAS's camera, the impacts that the acts of seeing and perception have on the development of new programs, and how employing these visual tools impacts the physical world. In other words, how do drone-mounted cameras change the ways humans 'see' and engage with the world in a military context, and how does human 'vision' affect the development of new UAS-related technologies? When the world becomes a picture, how do UAS operators understand and engage with these "digital reproductions" of reality? The author analyzes an incident in which a Predator UAS whose operators based in Nevada misidentified a convoy of Afghanistan civilians as a military threat, to provide context for why newer programs for targeted visual intelligence and data networks (for example, the "Gorgon Stare" and "Mind's Eye") offer UAS pilots a greater field of view, providing additional environmental information that might aid in reducing civilian casualties. These new systems rely more heavily on algorithms that identify "visual patterns that could signify a threat" (211). Because the production of the image results in destruction in the real, physical world, the author argues the process inherently erases individuality and personality of possible targets.

Lee, Lila. "Drone Warfare: War in the Age of Digital Reproduction." Master's Thesis, Lund University, 2012.

Lee's thesis is divided into three parts: first, the definition of UAS and some case studies of their military uses; second, the impacts of mechanization on the First World War and the Futurist movement, especially focused through an essay by early 20th century philosopher Walter Benjamin; and third, uses of UAS and 'drone vision' in the modern military. She traces how at the turn of the 20th century, the reproduction of an image created a 'fact' or shared reality; with UAS, viewing ***is*** fact, as the viewing of the UAS' actions and movements are reality. UAS—like machine guns before them—changed subjective definitions of reality. The author maintains that the resultant images then create meaning, albeit removed from the physical space where the image was created/captured, and then subject to repurposing by those involved in the circumstances that gave rise to the image. The author then analyzes newer components developed for UAS, such as "Mind's Eye" and "Gorgon Stare", and modern uses of UAS within the framework of Benjamin's treatise.

Mackinnon, Lee. 'No One Has Yet Determined What Art Can Do.' *Third Text*, 26:5, 2012, pp. 625-628, http://dx.doi.org/10.1080/09528822.2012.712775.

Analysis of a gallery event that focused on what artists and advocates characterize as human rights abuses resulting from American-driven UAS actions abroad. The physical space included photography by Noor Behram, a video installation by the Butler Brothers, and conversations between human rights lawyers. The author questions whether or not

this is “art”. Though overtly framed by the host gallery as “documentation”, the author revisits questions about whether socio-political commentary is ‘art’ and comes to the conclusion that the real substance is found in the conversations taking place, which in turn fuel the creation of “art with a capital-A” meant to further critique UAS military actions.

Morrison, Andrew, Ragnhild Tronstad & Einar Sneve Martinussen, “Design Notes on a Lonely Drone.” *Digital Creativity*, 24:1 (2013), pp. 46-59, DOI: 10.1080/14626268.2013.768534.

Conceptual exercise focused on UAS by using design fiction, formulated as a narrative set in the near future entitled *Wi-Fly*, which they define as “broadly a GPS locative media narrative work” (48), accomplished through the fictional addition of human genes into a UAS to improve its ability to sense and survey the physical environment. The authors situate *Adrona* (the fictive hybrid identity) firmly within design fiction through the application of what they term ‘discursive design’ (48), defined as the proactive application of lab-based analysis and speculation to the design process. The article begins with an interweaving of Adrona’s ‘perceptions’, expressed as poetry, with design research methodologies, before shifting to formal discourse about the relationship between form and function.

Musiol, Hanna. “Museums of Human Bodies.” *College Literature*, Vol. 40, No. 3 (Summer 2013), pp. 156-175.

Drawing on the 1930s essay by Walter Benjamin entitled “The Work of Art in the Age of Mechanical Reproducibility”, this article analyzes the aesthetics of display in the modern context with a focus on works addressing human rights, and how these concerns are visible in the museum/gallery environments. UAS are covered in a subsection entitled “How Does a Drone See?” which posits that for military purposes, seeing through technology has surpassed using physical vision since WWII. Musiol maintains that UAS act as a distant “museum [...] of observable bodies” and that this theory is reinforced through visual selection (by the UAS pilot) of what is to be preserved vs. destroyed. The resultant imagery can be considered to be akin to early Western museums exhibiting non-Western cultures—selecting that which fits a particular narrative or perception about the target culture. UAS images are also “aesthetically evaluated, spatially redistributed, and humanized and dehumanized in the process” by the UAS pilots, a process that the author maintains further draws similarities with the curatorial process.

Sanders, Jay. "Introduction." *Astro Noise: A Survival Guide for Living under Total Surveillance,* edited by Laura Poitras. New York: Whitney Museum of Art and Yale University Press, 2016, pp. 25-35.

An edited volume under the guidance of journalist-artist Laura Poitras, *Astro Noise* consists of essays that address the increase of surveillance technologies. The authors include artists, technology experts, academics, novelists, and a former Guantanamo Bay detainee, each of whom contributes to, as the title states, a guide to life in a modern surveillance society. Sanders' introduction is largely a transcription of an interview with Poitras, who was one of the first journalists contacted by Edward Snowden after his flight from the US. This volume accompanied an exhibition at the Whitney Museum in New York, in which Poitras installed a projection work entitled "Bed Down Location", a name that references the military name for "sleeping coordinates of people targeted for assassination by drones" (29) and replicated the night skies in Yemen, Pakistan and Somalia.

Stahl, Roger. "What the Drone Saw: The Cultural Optics of the Unmanned War." *Australian Journal of International Affairs,* 67:5, pp. 659-674, DOI: 10.1080/10357718.2013.817526. Accessed 03 May 2016.

Focuses on the role of UAS in relaying war imagery, and how resultant images impact the ways UAS are viewed and understood by the public. This is largely a study of the optics of UAS military activities expanding beyond how visuals are employed in the identification of targets, to the question of how UAS footage is presented to cultivate and maintain support in the public and political spheres, who supply the personnel, goods, and funding for the use of UAS. US Department of Defense's official Defense Video and Imagery Distribution System (DVIDS) service supplies and often produces segments for journalistic use. Stahl discusses incorporation of UAS and similar technologies into 'first person shooter' games to bolster additional public support. The author maintains that the media tends to present from the point of view of drone pilots rather than taking on other perspectives, for example, that of intended target, or that of unintended victim. The article's broad theoretical touchstones are of "interactive consumption" (battlefield is distant) and a second theme of "tendency to domesticate war" (battlefield is already 'here'). Stahl argues that these strategies result in the diminishment of public discourse and/or negotiation regarding military/state violence in the West.

Sweet, Derek. "Attack of the Drones." *Star Wars in the Public Square: The Clone Wars as Political Dialogue,* Jefferson, North Carolina: McFarland and Company, 2015, pp. 150-178.

The author analyzes broader societal questions and concerns about the role of UAS technology in everyday life, in particular the human/machine divide, and the dual nature of autonomous technology in popular media (e.g., concurrently positive and negative roles presented in *Robocop* and *Terminator*). The essential question of the article is whether popular culture portrays increasingly autonomous technology as dualistically to

be celebrated or to be feared. The argument is first traced through the films *Forbidden Planet, Silent Running, Wall-E, Terminator, and Terminator 2: Judgment Day.* In the section entitled "Fearing the Reaper", the author draws out the argument that as UAS autonomy increases, "killer drones" will likely emerge with higher numbers of civilian casualties, primarily as the result of a lack of empathy, compassion, and judgment, which are not programmable in UAS, categorized as dispassion (lack of empathy), distinction (between hostile and non-hostile targets) and disruption (of social order). The section "Attack of the Drones" draws an analysis from the serialized television production of the same name, wherein 'positive' and 'negative' forces employ UAS-like technology to achieve their societal aims. Sweet argues that the positive droids (essentially, drones of the future) are depicted as capable of emotion, pathos, etc., whereas the negative ones remain cold, detached, and program-driven.

Vavarella, Emilio. "Interview with the Drone: Experimenting with Post-anthropocentric Art Practice." *Digital Creativity*, 27:1, 2016, pp. 71-81. DOI: 10.1080/14626268.2016.1144616.

The author presents his work MNEMODRONE, which is a collaborative effort with artist Daniel Belquer. MNEMODRONE takes peoples' private memories and then attempts to use them to create a database, which a UAS then accesses to respond to external stimuli. These interactions between UAS and environment are "based on a combination of classic theories in the field of agent-environment interaction" and subsumption architecture. While the database material provides MNEMODRONE its basic structure, the UAS moves autonomously and without predictability. The database 'memories' were gathered from the public over ten months between late 2014 and mid 2015, and more will be gathered in the future. The memories [read: data] gathered later will enable MNEMODRONE to 'evolve', according to the artist. The subsection "MNEMODRONE and the Problem of Consciousness" articulates the potential challenges if the project developing a consciousness as intended: how would that consciousness be recognized or analyzed, given that consciousness is a human-centered phenomenon with human-oriented limitations. Vavarella posits that the answer lies in the nature of art itself, which allows for ambiguities that science doesn't, and allows for risks; success in art is defined differently, and art can seek to ask more questions "rather than collecting answers" (73). In the "Extended Mind and Enhanced Cognition" subsection Vavarella questions whether the computing 'cloud' is another tool for expanding knowledge (as pen & paper are). Further, if an artificial intelligence (in this case, UAS) accesses that cloud of shared knowledge and uses it to develop and enhance a consciousness, does its mechanical structure negate a state of 'full' consciousness? The article concludes with an interview conducted with the media artwork itself, answers in which are based on the memory database that uses human-generated tags.

PART B: METHODOLOGICAL AND TECHNICAL UAS TOOLS FOR ARTS AND HUMANITIES

Gutierrez, Gerardo, Grace Erny, Alyssa Friedman, Melanie Godsey, and Machal Grados. "Archaeological Topography with Small Unmanned Aerial Vehicles." *The SAA Archaeological Record*, vol. 16, no. 2 (March 2016), pp. 10-13.

The article compares results of mapping the same artificially constructed feature with a UAS platform versus a total station. The total station has the benefits of not needing trigonometric processing and is much quicker; for example, contour maps and 3D models of the site were produced and available for study within thirty minutes of conclusion. Challenges of total stations are their expense, difficulty in operation, and amount of time they consume in the field. Comparatively, UAS are less expensive (as tested) and easier to learn, but processing UAS data took more time, generated some 'artifacts' that then got shared into other data programs. The UAS did yield high quality images of the site, though these could be impacted by vegetation or weather.

Hendrickx, Marijn, Wouter Gheyle, Johan Bonne, Jean Bourgeois, Alain De Wulf and Rudi Goossens. "The Use of Stereoscopic Images Taken from a Microdrone for the Documentation of Heritage: An Example from the Tuekta Burial Mounds in the Russian Altay." *Journal of Archaeological Science* 38 (2011), pp. 2968-2978.

UAS provide less expensive data acquisition for documenting cultural heritage than previous techniques. While nuances of site locations and weather conditions are still factors, UAS (specifically, microdrones) have proven themselves useful and accurate in archeological fieldwork. This article focuses on the use of a quadrocopter to provide digital elevation models (DEM) and orthophotos at a site in the Russian Federation by providing data acquisition and data processing methodologies. The fieldwork is part of a long-term collaboration between Ghent University's Department of Archaeology and Gorno-Altaysk State University, and focuses on Scythian burial grounds; this article focuses on Tuekta, one of these burials, as a test site for drone mapping. Much of the article focuses on the specific methods used for mapping the site, programming and setup involved for the drone, and data processing. At its conclusion, the team successfully mapped the site in three days using three different systems.

Mark, Robert and Evelyn Billo. "Low Altitude Unmanned Aerial Photography to Assist in Rock Art Studies." *The SAA Archaeological Record*, vol. 16, no. 2 (March 2016), pp. 14-16.

Petrogylphs, geoglyphs, and rock alignments could benefit from use of drones to accurately map sites from above, and provide a low cost alternative to other forms of documentation. This article presents examples of fieldwork studying rock art in Sears Point, Arizona in comparison with results yielded using a hot air balloon, a Cessna light aircraft, and a helium balloon. Drone footage enabled researchers to confirm site degradation, document otherwise inaccessible cliffside sites, photograph petrogylphs

etched on the tops of boulders (that would otherwise require walking on the glyphs themselves), and to capture sites in aerial views that revealed manmade structures that were not discernible from the ground.

Scheible, Jurgen, Achim Hoth, Julian Saal, and Haifeng Su. "Displaydrone: A Flying Robot Based Interactive Display." Proceedings of the 2nd ACM International Symposium on Pervasive Displays (PerDis '13), 2013, pp. 49-54.

By combining an octocopter, projector and a smartphone, the authors present a means by which UAS can be easily and cheaply converted to 'flying interactive displays', which they name Displaydrone. Once airborne, users can send text messages to the Displaydrone that are then projected onto the preferred surface. The dexterity of drones allow for projections be presented on unconventional or generally inaccessible locations, such as buildings and landscape features. The bulk of the articles describes the Displaydrone's operation modalities, display design, and field experiments. Positives include user-friendly and inexpensive interfaces that facilitated large-scale public discourse, and challenges encountered include stability of image, battery life, and limitations of display content. Authors indicate that in the future they aim for an autonomous Displaydrone iteration that doesn't require a human operator.