"Out of the Loop": What Drone Fiction Can Teach about the Regulation of Collateral Damage from Lethal Autonomous Weapons

Sara Deutch Schotland

Abstract

Under the current United States Department of Defense policy, military drones are semiautonomous aerial vehicles operated remotely, with some level of human supervision. However, at a time when China has developed a fully autonomous drone, the question arises whether other political powers will follow suit or retain humans "in the loop" for drone targeting and engagement.

Short stories such as "Collateral" by Peter Watts and "In the Loop" by Ken Liu caution against the risk of civilian casualties if machines make the final decisions in target choice without human oversight.

Introduction

In the years ahead, the U.S. and other Western powers will have no easy choices to make regarding whether to increase automation in weaponry. The gold standard of International Humanitarian Law (IHL) cautions against civilian casualties, but drones operated purely by an algorithm may increase the potential for civilian casualties. This essay considers the topic by applying an interdisciplinary approach that focuses on the interplay between dystopian war fiction and international law—a "law and literature" perspective. By providing an additional way to think about the consequences of policy choices, fiction can complement the disciplines of political science, social science, and law. Speculative war narratives such as Peter Watts's "Collateral" (2014) and Ken Liu's "In the Loop" (2014) invite us to engage in imaginative thinking about the risks of removing human judgment, imperfect as it is, from the decision to target and engage.

IHL—Can LAWS Comply?

The U.S. Department of Defense (DOD) defines an automated weapons system (AWS) as

> [a] weapon system that, once activated, can select and engage targets without further intervention by a human operator. This includes human-supervised autonomous weapon systems designed to allow human operators to override operation of the weapon system, but can select and engage targets without further human input after activation. (*Directive* 13-14)

As part of that system, drones are designed to be precise weapons and to minimize civilian casualties, as well as avoiding loss of military personnel. Although the number of drone civilian casualties is unknown and contested given the debate about definitions and data reliability, drones have an inherent potential to cause such casualties. This type of risk emerges due to the precision and flexibility of drones, which enable

them to be used in populated areas where other forms of lethal force might not be used with the hope and expectation that their precision will mitigate civilian casualties (Anderson 427). In other words, drones are used in the hopes of avoiding collateral damage. DOD defines collateral damage as "unintentional or incidental injury to persons or objects that are not lawful military targets" (*Dictionary* 35). It differs from accidents and deliberate and indiscriminate attacks on civilian populations because it is legal behavior if the collateral damage conforms to the requirements set by IHL (Cronin 176).

IHL sets forth four principles to protect against civilian casualties: distinction, military necessity, proportionality, and feasible precaution. Distinction requires combatants to always distinguish "between the civilian population and combatants and between civilian objects and military objectives" and to direct their operations only against military objectives (UN §48). Military necessity involves identification of objects (i) "which by their nature, location, purpose or use make an effective contribution to military action" and (ii) whose "destruction, capture or neutralization […] offers a definite military advantage" (§52). Proportionality requires that combatants weigh anticipated loss of human life against expected military advantage prior to attacking to avoid "excessive" civilian losses (§51). Finally, "[a]ll feasible precautions" must be taken by commanders to minimize collateral damage (§57).

The attributes of drone usage and the need to act according to IHL parameters lead to the following question: can lethal autonomous weapons systems (LAWS) such as drones follow IHL and avoid unnecessary civilian casualties? To evaluate these concerns, one must consider the difference between the three categories of LAWS: semiautonomous, human-supervised, and fully autonomous systems. The first type of system currently deploys a human-in-the-loop system that may

> employ autonomy for engagement-related functions such as tracking, and identifying potential targets, prioritizing targets, and timing when to fire […]. In-the-loop systems do not engage a target without human operator control; the moral

> agency of the life and death decision resides with the human not the machine. (Mull 480)

In an intermediate stage, humans 'on-the-loop' can override a decision made by the LAWS, but often there is little time for such intervention. Moreover, an 'automation bias' may lead the human supervisors to proceed with engagement directed by the LAWS based on faith in the programming (481). In contrast, in 'out-of-the-loop' systems, the machine has full autonomy "for all engagement-related functions up to and including launching a kinetic strike" (482).

Nicholas Mull argues that LAWS that delegate the actual decision to engage a personnel target to a machine "without human review and conscious approval" are both "contrary to the laws of humanity and public conscience" (471). Such systems create a responsibility gap for violations of the law of war amounting to war crimes. Moreover, they may lower the threshold of the willingness of states to resort to armed force (471). LAWS are advocated because they promise mitigation of risk to human life as troops are removed from the hazards of combat. Additionally, "[i]n a true LAWS, human-on-the-loop or human out-of-the-loop targeting decisions are in fact not decisions; instead, they are the playing out of mathematical calculations" (500). The machine lacks free will; it is mathematical formulae that dictate when and whether to engage the target. LAWS thus conflicts with an ethical tenet of warfare: "Honor among warriors must be understood to require enough respect to not delegate the decision of death to a machine" (477). A machine is likely to weigh proportionality as it is removed from moral, physical, and psychological consideration of the impact of inflicting civilian casualties (508). Combat decisions require situational awareness; they require a synthesis of morality and professional judgment based on the evaluation of tactical and strategic consequences. As Mull asks, if we would not trust a machine to serve as our psychologist or judge or jury, why should we entrust a machine to take human lives? (529).

Based on his experience as former Commander of the Israel Defense Forces School of Military Law, Amos Guiora insists on the importance of human accountability. Command responsibility requires a

human assessment reflecting on the threat posed, recognition of the costs and benefits of the operation, evaluation of potential collateral damage, and consideration of alternatives. For Guiora, "[a]utonomous weapons systems that remove the human being from the firing loop are unacceptable because they undermine the possibility of holding anyone accountable for what, if done by a human soldier, might be a war crime" (419). Charles Trumbull acknowledges that LAWS offer many advantages, including faster data analysis and reaction times, greater endurance, the ability to launch scaled attacks and operate in environments lacking optimal communications systems (545). They also have the potential to minimize harm to civilians by reducing opportunities for human error (547). However, it is doubtful that drones can appropriately assess the relative threat posed by dual-use facilities and equipment: "A pick-up truck parked at Walmart would almost certainly be a protected civilian object. This same truck parked near a known terrorist camp, however, could be a legitimate military objective" (576). Machines may never be capable of making the type of sophisticated analysis that determines when an object with both civilian and military uses contributes to the military effort in order to justify targeting.

In November 2019, US Secretary of Defense Mark Esper remarked that China was offering fully autonomous lethal drones for sale in the Middle East and Africa (US DOD, "Remarks"). These fully autonomous drones have the capability of conducting lethal targeted strikes. In response to Chinese and Russian initiatives, DOD adopted five ethical principles: that A.I. use would be "responsible, equitable, traceable, reliable, and governable" ("Press Briefing"). In that same briefing, General Jack Shanahan acknowledged that DOD was revisiting its AWS Directive 3000.09, which was written in "a pre-A.I. Time." The Bipartisan National Security Commission on Artificial Intelligence recommends that the US military adopt A.I. urgently without letting ethics debates about human control "paralyze AI development" (NSCAI 16). This pressure to address AI-enabled autonomous systems is motivated by the choices being made by America's strategic competitors (15). Notably, the Commission does not use the phrase 'in the loop,' leaving open the possibility that humans may not be present to oversee the drones.

Heather Roff, an expert on military technology now with the Brookings Institution, expresses concern about treating machines as capable of independent lethal action. In cautioning against the dangers of "strategic" or "killer robots," Roff argues that the fact that "we do not at present have lethal autonomous learning robots does not preclude" consideration about a "middle term": "For example, if a machine is not a fully autonomous learning robot, but somewhere in between our current capacity and artificially intelligent, what capacities would it have to have to be considered permissible to use?" (222). The fact that the US is reexamining its policy on fully autonomous drones heightens the relevance of examining fiction that can assist in reflecting on the risk if humans are no longer 'in-the-loop.'

Peter Watts's "Collateral": Risks of the Cyborg

War science fiction is a subgenre of dystopian science fiction. As defined by Gregory Claeys, a dystopian text represents "the fictional portrayal of a society in which evil or negative social events have the upper hand" (107). Science fiction presents us with a technological *novum*, a novelty or innovation not currently known, but rather a mental experiment based on extrapolation from current knowledge (Suvin 63). Dystopian science fiction extrapolates from current technology to warn about what will happen in the near future if a current trend is not arrested. Thus, war science fiction offers an impactful portrayal of the consequences of unleashing increasingly dangerous technology in military scenarios. Peter Watts's 2014 story "Collateral" envisions a dangerous extension of the trend to LAWS, where a pernicious regime uses killer drones operated by cyborgs who have been programmed for their lethal efficiency. The cyborgs are wired and re-wired to strip away conscience and regret. Under these circumstances, collateral damage is accepted by the command structure as an inevitable corollary of a war whose mission is never explained, much less justified.

"Collateral" involves a cyborg drone operator, Nandita Becker, who is employed by the Canadian army in its war against the Chinese. Becker is a corporal—a rank that at once suggests her partial

embodiment and as well as her low military status. In an incident—downplayed as an "accident"—Becker terminates the lives of eight civilian students in a fishing boat who were doing a project on art and cultural anthropology. Significantly, we learn little about the reasons for Becker's error—she has fired because she found the boat in an unauthorized location, from which she surmised that the crew members were "hostiles" (318). Blanch, her apparently human "mechanic," tells Becker that they have to get back to base before "this thing explodes" (317)—the explosion feared is not a combat hazard, but a government investigation and adverse publicity. Becker is aware that she has ended lives: "'They—they were human…' She thought they were anyway," but even as she struggles with the unintended killing, Blanch is "playing around in the back of her brain" deleting her "op logs" (317). Becker has been designed as a "superhuman killing machine," yet she is unable "to scrub those images from her memory" (318). The mechanic consoles Becker for the incident: it is just a consequence of war that "shit happens" (318). Becker's handlers tell her "not to worry […] it wasn't her fault" (319). This trite expression assumes importance here. Whose fault is it that innocent students have been killed?

The Canadian military will be asked to explain how the error could have occurred when "Augments," as the cyborgs are called, are supposed to be able to identify unarmed civilians. In response, Command proactively engages in damage control. The JAG lawyer prepares the defense that since there aren't any fish in the area, no fishing boat should have been there: "You can't fault the system for not recognizing profiles that aren't even expected to exist in the zone" (319). This is a twist on "blame the victim": the students were in the wrong place at the wrong time. The mechanic—aptly named Blanch—attempts to whitewash the incident as "a systems failure" (320). The Public Affairs Officer gives the excuse that "accidents happen […] Drones misidentify targets […] No technology's perfect. Sometimes it fails. It's that simple" (320). Although Command accepts civilian casualties as inevitable, military authorities must take account of public opinion. Thus, Command decides to create a counternarrative to defuse public outrage and criticism from the House of Commons. They grant liberal journalist Amal

Sabrie, well-regarded by human rights activists, the opportunity for an exclusive interview with Becker. Sabrie is known for her "almost pathological empathy for victimhood" (322). Command's goal is to get Sabrie to portray Becker as herself a "victim […] a tool of the patriarchy" (322). Sabrie's interview with Becker reveals the cyborg's hybridity. Like a human, Becker looks tired from sleeplessness, yet she has wings from her shoulders—equating her to an "angel of death" (322). As an Aug, Becker's spines and bones have been reinforced; she has also been programmed—inside she is "plug and play" (323). In response to Sabrie's question "Do you *feel* like you killed them?" Becker responds "I—*part* of me did. Maybe." Becker tells Sabrie that she feels "fucking *awful*" (323, emphases in original). When a drone operator kills civilians, their identities are generally unknown to the operator. However, Sabrie provides Becker with the names of the victims—names that have a minority ethnic background. Once Sabrie reads her the names, Becker realizes that her propranolol medication is not working; it is not protecting her from the post-traumatic stress disorder (PTSD) she is experiencing. Learning the names of the civilians brings home to Becker the realization that real human lives have been lost.

Rather than suspend or retire Becker, Command plugs her into an alternate universe where she relives scenarios in which she kills not only the students in the boat but a hundred civilians in a hundred different ways. Becker is reprogrammed to strip her of her conscience, to accept collateral damage without any compunction. She realizes that Command wants to "toughen her up. Get her back in the saddle, desensitized through repetition, before her own remorse made her useless on the battlefield" (326). Becker is being trained to be a fully automated eye in the sky, an unblinking and unthinking "point and shoot": "Sometimes there didn't seem to be a right answer, no clear way to determine whose life should take priority […] Fuck this handwringing over the relative weights of human souls. Just point and shoot. I am a camera, she thought" (326). Soon after, Command performs radical surgery on Becker's brain. The operation is labeled by her handlers as a success because now she can take out targets 600 milliseconds faster than before her "upgrade" (331). In contrast, Becker reflects differently

on the results: "the compassion, the empathy, the guilt. The moral center. That seemed to be gone […] They'd burned it out of her like a tumor" (335). Becker can only be effective if her conscience is eliminated, if she is made more like a machine.

Debate rages in the media over Becker's culpability. The talking heads on the news shows opine that Becker "was as much a victim as those poor 'envirogees,'" the climate refugees "her hijacked body gunned down" (333). One journalist points out that if China is using cyborgs, so must Canada. In contrast, another commentator expresses concern: "What happens to the very concept of a war crime when every massacre can be defined as an industrial accident?" (334-35). Other critics object that the outrage over the massacre of civilians has turned into an outpouring of sympathy for Becker, that the profile written by Amal Sabrie reads almost like "a love letter" (335). As in the case of an "embedded journalist" who becomes sympathetic to the military's war aims, Sabrie takes the bait as Command had intended, and portrays Becker sympathetically.

The story takes a surprise twist. Sabrie and Becker discuss in a subsequent meeting an apparently senseless act, in which a man opened fire on innocent children in a daycare center. Becker points out that the killer had himself lost his sister in a shooting incident. The daycare massacre was a desperate act of protest: "Words haven't worked. Advocacy hasn't worked. The only thing that might possibly work would be something so unthinkable, so horrific and obscene and unspeakably evil, that not even the most strident gun nut could possibly object to—countermeasures" (337). To the reader's surprise, Becker murders Sabrie in order to discredit the drone program: "It was messy, but she got the job done. Because Corporal Nandita Becker was more than just a superhuman killing machine. She was the most ethical person on the planet" (338). This quote, not directly attributed to anyone but seemingly Becker's interior monologue, indicates that Becker has decided to kill Sabrie because she can find no other way to torpedo the drone program.

Before she kills Sabrie, Becker dismisses conventional morality, including the assumption that it matters whether you look into someone's eyes when in combat. This evokes Emmanuel Levinas's observation

that the soldier in conventional warfare who looks into another man's face, especially his eyes, experiences a Biblical command: "Thou Shalt Not Kill" (89). No such restraint applies to Becker, perhaps because her own humanity has been stripped away so that she feels no responsibility for the Other; perhaps because she feels that conventional morality must give way to a greater imperative to end the program. Becker was programmed to choose to save the many over the few, yet she adds another victim to the tally of innocents she has killed. Paradoxically, this killing might be seen to serve utilitarian ethics as it appears designed to achieve the greater good of ending a military program that devalues human casualties. From a deontological point of view, the killing of Sabrie would of course be unjustifiable because she is used as a tool: Sabrie's death is a means to the end of facilitating the Canadian military's dangerous drone program. From the perspective of this half-human, half-machine, the greater good necessitates one more sacrifice.

Watts's story illustrates multiple downsides of LAWS stripped of the human element. First, because Becker is part machine, the targeting of the fishing boat can be ascribed to equipment malfunction, and thus exonerated from violation of IHL. Even if the malfunction could be prosecuted as a war crime in violation of the UN Protocol or as an act of reckless endangerment, the further issue arises that it is not certain who will be legally accountable. "Collateral" also illustrates how tragic incidents involving LAWS can be dismissed as "mere accidents"—outside the scope of IHL. The fishing boat was not a target of Becker's mission. It was eliminated because the boat wandered into a forbidden area. The authorities try to package the incident as an unfortunate "accident," as has been observed in the analysis of other drone narratives. In her discussion of drone film, Agnieszka Piotrowska cites Paul Virilio's observation that the twentieth century was characterized by mass accidents, from the sinking of the Titanic to nuclear meltdowns. Humanity may have advanced technologically but at a cost of destruction and loss of ethical values. Virilio argues that these accidents must be exposed so that we can be aware of the danger and make a conscious effort to use technology responsibly (5).

This story raises the concern that drone warfare targets those whose lives and bodies are perceived as having lesser value, discountable in calculating national or even imperialist military objectives. Judith Butler has written about the consequences of anonymity, the dearth of stories in the media about children killed by the United States during the Gulf War. She notes that "[i]f there were to be an obituary, there would have had to be a life, a life worth noting, a life worth valuing and preserving, a life that qualified for recognition" (*Precarious Life* 34). In *Frames of War*, Butler distinguishes between apprehending a life and recognizing the figure as fully human. A figure "can be apprehended as 'living,'" but not necessarily "recognized as a life" (8). Lives that are not recognizable are also not grievable: "[t]hey cannot be mourned because they are always already lost or, rather, never 'were'" (33). "Collateral" reflects the continuing denigration of those who are ethnically different. While the ethnicity of the victims in Watts's story is not specified, they were not Anglo- or French-Canadian. Ironically, the victims were students of cultural anthropology.

The choice of a cyborg heroine brilliantly illustrates the no man's land of current policies towards LAWS, where autonomy is divided between human and machine. As described by Donna Haraway, the cyborg figure represents a complex being, a synthesized creature that straddles the traditional distinctions between human and animal, man and machine, and the physical and non-physical. The cyborg explores "transgressed boundaries, potent fusions, and dangerous possibilities […] as one part of needed political work" (154). Becker certainly stands at the midpoint between human and machine. In "Collateral," Becker comes to appreciate that she is no more than an eye in the sky, transformed into a camera, literally designed to "point and shoot" (326). The military has done all it could to strip away the humanity that made her a less efficient killing machine. She is a surveillance camera, not a soldier. Becker's remorse may in part reflect that, although a cyborg, she identifies as female. Therefore, Becker is subject to the patriarchal control of male figures, generals, mechanics, programmers, lawyers, and public affairs officers. The female figures in "Collateral" struggle with the unintended death of innocent victims attendant to the war. Sarah

Ruddick, among others, has argued that there is a prevailing attitude among females of promoting a "politics of peace"—a disposition to oppose militarism and war (127).

Ken Liu's "In the Loop": Trauma Matters

While "Collateral" is focalized on the trauma experienced by a cyborg drone operator, Ken Liu's "In the Loop" describes the torment experienced by a human drone operator who inflicts civilian casualties. Studies and oral histories confirm the PTSD experienced by drone operators today. They routinely monitor potential targets for

> a twenty-four-hour cycle of life surveillance during which they regularly observe the man below interacting with his wife and children. Reality—that an operator is about to cause the death of another human being—is brought to bear while watching the target take his last meal, hug his wife for a final time, and bid his children farewell. (Stack 774-75)

Other stress arises from the uncanny, divided life that the operator leads: long hours in the trailer sitting behind the screen in an up-close and personal virtual war zone, then a return home to interact with spouse and children (Asaro 306). Operators report that contrary to popular assumption, their experience is not like that of a video game; they "can't switch it off. It's always there" (309). Offering his first-person account, Brandon Bryant writes that his "personal life was filled mostly with depression and loneliness […] when you're finally alone with your thoughts before bedtime you feel a bit of your soul crumble to dust" (317). In an interview, Bryant explained that his experience was worse than a mortar attack because artillery "doesn't see the results of their actions. It's really more intimate for us because we see everything" (Ricks).

The protagonist in Liu's story is the daughter of a former drone operator. When Kyra was nine years old, her father turned into a "monster," so abusive that her mother took her away to safety. Kyra learns as a young child her father was responsible for a very precise number

of kills—3251—before deciding to take his own life. As a young adult, she seeks employment with Cyberdyne Systems, a contractor engaged in building an ethical drone—a machine designed to be better than a human operator who might hesitate too long or be too quick to pull the trigger. Kyra is motivated to sign up so that no one should have to bear the guilt and responsibility that her father did.

Kyra's boss at Cyberdyne Systems tells her that deciding whether to shoot when you have "confusing, contradictory intel is not the kind of thinking humans excel at" (5). He lures Kyra into the job by promising that machines can "make a better soldier than a human" (5). He explains that humans are too emotional and act on the basis of hunches and feelings. They may become confused by shaking video images and ambiguous intelligence. The operator may hesitate too long or may be too quick to pull the trigger (5). Therefore, the boss concludes, when individuals are "out of the decision-making loop, the result should be less collateral damage and a more humane, more civilized form of warfare" (5). Cyberdyne designs software "to replicate what human operators do now, only better"; it will be a "clean war" (7). The project involves distilling videos of past drone strikes, some accurate and some inaccurate, to make a more reliable procedure for identifying militants. Kyra's job is to translate the video analysis into code. For Kyra, who knows the human cost of acting at a drone operator, it seems—at first—a promising step to save human beings from the anguish experienced by her father.

Kyra is assigned to the AW-1 Guardians Unmanned autonomous flying vehicles project. This flying truck is designed for populated urban areas where there are lots of allies—called "friendlies" in the story—to protect. Kyra begins to work on a protocol that is ostensibly an "ethical governor" responsible for minimizing collateral damage when robots fire upon suspects. It is supposed to be a "conscience for killing machines" (7). To enable robots to minimize collateral damage, Kyra must assign a value to each life that might be endangered in a crowded urban area. Problematically, the algorithm involves racial profiling. When Kyra hesitates to follow the instruction, she is told that the point of war is to prefer the lives of one group over another group. In predicting collateral damage, Americans are assigned the highest

value, followed by allies, while the poor and desperate are assigned lower values. Kyra's boss refers approvingly to the army's practice during World War II of using Japanese Americans to teach dogs to attack soldiers with the enemy's facial characteristics (8). Under the notorious Cat Island program, the Army developed a canine training program to minimize direct contact between GIs and the enemy. Twenty-five Japanese American servicemen were assigned to Cat Island, a barrier island off the Mississippi Coast (Paltzer). The dogs were trained to track down these Nisei soldiers as bait. The goal of the training was that the dogs would recognize Japanese soldiers and attack them without human handlers. The training was unsuccessful and eventually abandoned. Far from condemning this shocking experiment, with its evident racism and dehumanization of the enemy, Kyra's boss points to this training program as a model.

Once the programming is done, according to Cyberdyne, robots will make decisions consistently "without bias" (9). Of course, the contradiction here is that the algorithm prioritizes ethnic bias. As Katherine Chandler writes, there is a phenomenon of "unmanning" inherent in drone warfare whereby the American military denigrates its enemies as less than human (39). Yet Kyra accepts the task of profiling, again rationalizing that fighting with robots means no one has to feel responsible for killing, the agony that her father suffered. She reflects that she has mourned for years about her father's emotional pain, without grieving for the loss of the innocents whom he killed or the suffering that their families endured.

Kyra's assignment involves coding and manipulating, adding, and subtracting points based on the target's attributes. After that human input, the machine takes over. The use of mathematical formulae to determine targeting decisions is, as noted above, a serious concern with LAWS. Tom Holert criticizes drone warfare for imposing an "increasingly algorithmical and actuarial conceptualization of life and livelihood as essentially calculable and predictable" (102). Human lives are data points and there is no stopping the operation of the formula. When the enemy begins recruiting child soldiers, Kyra, as instructed by her employer, adjusts the algorithm to change the presumption against

killing children. Kyra's adjustments result in catastrophe when the code authorizes a strike that kills an innocent child. A young boy, who had a mental disability, had run towards an American in a busy market, likely out of curiosity. To her horror, Kyra realizes that her alteration of the formula triggered the death. The drone destroys him in a single shot. As with Nick Ut's 1972 photo of the wounded "Napalm Girl" that aroused public anger against the Vietnam War, the killing of this young innocent elicits outrage. A Senate investigation follows. Echoing the banality portrayed in "Collateral," Kyra's boss tells her it is not her fault, that she had done nothing wrong, and that "mistakes happen" (12).

Liu's story suggests that the mistake lies not in the code but in the system, which delegates the final choice to kill to an overdetermining, tyrannical formula. It was Kyra's error to seek to protect drone operators from PTSD. As the tragedy played out, the formula allowed an innocent child to die and Kyra's role as coder induced her own trauma. The fact that drone operators experience PTSD from the decisions that they make reflects their assumption of responsibility for killing another human being and a higher awareness of the consequences of warfare. The story showcases the need for the human operator to remain in the loop, to make nuanced judgments against disproportionate infliction of collateral damage—judgments that may not be perfect and for which they can be held accountable.

Conclusion

Drone fiction brings home to the reader a paradox: drones are used because of their obvious advantages—the machine does not tire, its eyes do not blink, it has extraordinary capability while resisting emotional weakness and hesitation. However, these very strengths—which make it superior to human soldiers—give rise to dangerous potential. The more precise drones are programmed to be and the greater the efficiency in eliminating specific targets, the more likely they will be directed to populated areas where the civilian is at risk. In "Collateral," a science fiction narrative, and in "In the Loop," a story close to current capability, the collateral damage wreaked by LAWS is accepted by the regime

as inevitable. These stories caution against the perfect obedience that is offered by autonomous weapons untrammeled by human judgment, imperfect as it may be. Without humans in the loop, the commands generated by algorithms will be executed without the potential intervention of a human soldier's conscience.

Works Cited

Anderson, Joshua. "Putting Lethal Force on the Table: How Drones Change the Alternative Space of War and Counterterrorism." *Harvard National Security Journal,* vol. 8, 2017, pp. 426-70.

Asaro, Peter. "The Labor of Surveillance and Bureaucratized Killing: New Subjectivities of Drone Operators." *Life in the Age of Drone Warfare*, edited by Lisa Parks and Caren Kaplan, Duke UP, 2017, pp. 282-314.

Bryant, Brandon. "Letter from a Sensor Operator." *Life in the Age of Drone Warfare*, edited by Lisa Parks and Caren Kaplan, Duke UP, 2017, pp. 315-23.

Butler, Judith. *Precarious Life: The Powers of Mourning and Violence*. Verso, 2004.

—. *Frames of War: When Is Life Grievable?* Verso, 2009.

Chandler, Katherine. *Unmanning. How Humans, Machines and Media Perform Drone Warfare*. Rutgers UP, 2020.

Claeys, Gregory. "The Origins of Dystopia: Wells, Huxley, Orwell." *The Cambridge Companion to Utopia*, edited by Gregory Claeys, Cambridge UP, 2010, pp. 107-32.

Cronin, Bruce. "Reckless Endangerment Warfare: Civilian Casualties and The Collateral Damage Exception in International Humanitarian Law." *Journal of Peace Research*, vol. 50, no. 2, 2013, pp. 175-87.

Guiora, Amos N. "Accountability and Decision Making in Autonomous Warfare: Who is Responsible?" *Utah Law Review*, vol. 2017, no. 2, pp. 393-422.

Haraway, Donna. *Simians, Cyborgs, and Women: The Reinvention of Nature*. Routledge, 1991.

Holert, Tom. "Sensorship: The Seen Unseen of Drone Warfare." *Image Operations: Visual Media and Political Conflict*, edited by Jens Eder and Charlotte Klonk, Manchester UP, 2017, pp. 101-17.

Levinas, Emmanuel. *Ethics and Infinity*. Translated by Richard Cohen, Duquesne UP, 1982.

Liu, Ken. "In the Loop." *War Stories*, edited by Andrew Liptak and Jaym Gates, Apex, 2014, pp. 1-14.

Mull, Nicholas W. "The Roboticization of Warfare with Lethal Autonomous Weapon Systems (LAWS): Mandate of Humanity or Threat to It?" *Houston Journal of International Law*, vol. 40, no. 2, 2018, pp. 461-530.

Paltzer, Seth. "The Dogs of War: The U.S. Army's Use of Canines in WWII." Army History.org.

Piotrowska, Agnieszka. "5000 Feet is the Best' Drone Warfare, Targets, and Paul Virilio's 'Accident.'" *Disappearing War: Interdisciplinary Perspectives on Cinema and Erasure in the Post-9/11 World*, edited by Christine Hellmich and Lisa Purse, Edinburgh UP, 2017, pp. 34-55.

Ricks, Thomas. "The Future of War Essays: It's Back to the Beginning, or, 'The Nearness of You.'" *Foreign Policy*, February 5, 2014, foreignpolicy.com/2014/02/05/the-future-of-war-essays-its-back-to-the-beginning-or-the-nearness-of-you/.

Roff, Heather. "The Strategic Robot Problem: Lethal Autonomous Weapons in War." *Journal of Military Ethics*, vol. 13, no. 3, 2014, pp. 211-27.

Rogers, Ann and John Hill. *Consequences of Killing Without Consequences Unmanned: Drone Warfare and Global Security*. Pluto Press, 2014.

Ruddick, Sara. *Maternal Thinking: Towards a Policy of Peace*. Beacon Press, 1989.

Stack, Jane. "Not Whether Machines Think but Whether Men Do." *UCLA Law Review*, vol. 62, no. 3, 2015, pp. 760-93.

Suvin, Darko. *Metamorphoses of Science Fiction: On the Poetics and History of a Literary Genre*. Yale UP, 1979.

Trumbull, Charles P. IV. "Autonomous Weapons: How Existing Law Can Regulate Future Weapons." *Emory International Law Review*, vol. 34, no. 2, 2020, pp. 533-94.

United States, Department of Defense. *Dictionary of Military and Associated Terms*. Joint Publication 1-02, November 2010, as amended February 15, 2016. Web. fas.org/irp/doddir/dod/jp1_02.pdf.

—, —. *Directive 3000.09, Autonomy in Weapon Systems*, 2012, incorporating Change 1, 2017. Web.

—, —. "Press Briefing on the Adoption of Ethical Principles for Artificial Intelligence." *Defense.gov*, February 24, 2020. Transcript.

—, —. "Remarks by Secretary Esper at National Security Commission on Artificial Intelligence Public Conference." *Defense.gov*, November 5, 2019. Transcript. www.defense.gov/Newsroom/Transcripts/Transcript/Article/2011960/remarks-by-secretary-esper-at-national-security-commission-on-artificial-intell/.

—, National Security Commission on Artificial Intelligence. "Interim Report," *NSCAI.gov*, November 2019. Web. drive.google.com/file/d/153OrxnuGEjsUvlxWsFYauslwNeCEkvUb/view

United Nations. *Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts*. June 8, 1977, treaties.un.org/doc/publication/unts/volume%201125/volume-1125-i-17512-english.pdf

Virilio, Paul. *The Original Accident*. Polity, 2007.

Watts, Peter. "Collateral." *Upgraded*, edited by Neil Clarke, Wyrm, 2014, pp. 317-38.

Biography

Sara Deutch Schotland teaches Law and Literature at Georgetown University Law Center, Literature of War at Georgetown University, and Justice Topics in Dystopian Fiction at American University. She earned her B.A. from Harvard University, her J.D. from Georgetown University, and her Ph.D. in Literature from the University of Maryland.