On the Future Perfect of Artificial Intelligence and War: War and Algorithm Review

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1. Introduction

Earlier this year, the US National Security Commission on Artificial Intelligence (NSCAI) announced its conclusions in support of developing artificial intelligence as instruments of war and surveillance, including lethal autonomous weapons systems (or LAWS) for military use. This is not entirely surprising, given that the NSCAI hosts conferences called 'Strength through Innovation: The Future of A.I. and U.S. National Security'.[1] It is led by Eric Schmidt, former Google Chief Executive, a central figure in the interrelationship of the US defense community and Silicon Valley,[2] presiding over representatives from Google, Oracle, Microsoft and Amazon Web Services, as well as current and former members of the US defense department and other interested parties. More surprising may have been that the NSCAI posited a moral mandate as part of its recommendation. The NSCAI's vice chairman, Robert Work, former US Deputy Secretary of Defense, argued that it is 'a moral imperative to at least pursue this hypothesis', the hypothesis being that weaponized artificial intelligence and LAWS constitute a positive humanitarian good.[3] There is a problem, however, with calling this argument a hypothesis: namely, we cannot test it. As Gregor Noll points out in his contribution to *War and Algorithm* , we do not have access to a parallel universe in which we have the time and capacity to test the ways in which LAWS will change the

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1 The 2019 conference hosted by the NSCAI is available at: <www.nscai.gov/event/nscai_2019_conference_recap/> accessed 18 August 2021.

2 Schmidt is also one of the central figures chronicled by S Zuboff, *Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (Profile Books 2019).

3 J Dastin and P Dave, 'U.S. Commission Cites 'Moral Imperative' to Explore AI Weapons' *Reuters* (27 January 2021) <https://www.reuters.com/world/china/us-commission-cites-moral-imperative-explore-ai-weapons-2021-01-26/> accessed 18 August 2021.

battlefield, for better or worse. In lieu of an untestable hypothesis, *War and Algorithm* offers a probing interrogation applicable to Work's claim, along with a number of snapshots of the sorts of AI technologies under development for security purposes. These observations are framed in the introduction of *War and Algorithm* as part of a conversation across disciplines. The conversation has apparently been conducted slowly, steadily, and on an occasional basis, with the result that the principal authors no longer recall in some places precisely what material originated with whom. The product of their conversation presents the reader with a meditation on the nature and stakes of contemporary algorithmic technologies that have enrolled and been enrolled in the violence of war. I say enrolled and been enrolled because the book depicts a symbiotic relationship between these technologies and the militaries that deploy them; sometimes the technology fights for the military, sometimes the military fights for the technology.[4]

The book is written by three principal authors from three different academic fields—Max Liljefors, Gregor Noll and Daniel Steuer—each of them engaged by one of three interlocutors, Allen Feldman, Sara Kendall and Howard Caygill, respectively. Steuer and Caygill hold appointments in philosophy; Noll and Kendall in international law; Liljefors in art history, Feldman in media, culture and communication. The diversity of academic fields makes clear that the book is not principally a legal text. Moreover, the authors expressly disavow an 'interdisciplinary' aim.[5] They aim instead at 'disciplinary unruliness', which they associate with finding ways out of their 'professional confines'.[6] Understanding that ambition is key to appreciating the work and its salience for a legal journal tailored to conflict and security law. The authors communicate a widely-held concern that their several disciplines are each challenged at their limits by new technologies. They are looking for ways to meet those challenges. Their method is to push one another past disciplinary limits by confrontations from beyond each individual discipline. This does not mean that the authors abandon disciplinary constraints: each proceeds from a deep grounding in the dogmas of their respective fields. Nor will their unruliness satisfy every reader interested in surpassing disciplinary boundaries: these liminal exercises are situated and provoked by specific confrontations. The combination of political philosophy, law, art history and media studies here yields partial and particular demarcations of the borders among them. The choice of disciplines for this particular exercise is clear enough: the authors observe a radical change in the valence of international law and politics when practiced in a security environment defined by contemporary information media.

Consider, in this light, Fleur Johns's description of a redistribution of the sensible in international law, which refers in part to the algorithm- and data-

[4] G Noll, 'War by Algorithm: The End of Law?', in M Liljefors, G Noll and D Steuer (eds), *War and Algorithm* (Rowman & Littlefield 2019) 85.
[5] ibid 3.
[6] ibid.

driven ways of knowing and constituting the world in which international law is practiced.[7] Johns describes techniques of pattern recognition applied recursively and reiteratively to constant streams of information and images, to construct an actionable international space in any given institutional context. The actionable construction is enabled by a technological distribution of sensors and processors, sensors to generate information about the world, processors to assemble it into actionable substance. Such information systems, featuring cables, satellites, sensors, computers and screens, among other things, are part of the military technologies including LAWS and drones that drive the concerns in *War and Algorithm*. The technologies that are reshaping the construction of international spaces are not available equally to all, and the same technologies are reshaping the ways of securing the world they help to construct. Combinations of biometric and GPS technologies control flows of people at borders in new ways, while also enabling movements of weaponized drones across the same borders, changing the valence of borders in the process.[8] In this new distribution, there is a live debate as to how Charter principles of territorial integrity apply in cases of drone operation,[9] or even whether international humanitarian law *can* apply to autonomous weapons systems.[10] As Robert Work's quote already underscores, there is a sense in which technologies have pushed our legal-institutional devices to the limits of their applicability, so that high-level policy committees resort to extra-legal hypotheses to justify the emerging security architecture they are building for the conduct of war. The authors in *War and Algorithm* meet this sense of frustrated limits by drawing vocabularies of law and politics into confrontation with vocabularies of media and art. In this review, I will try to respect the authors' ambitions to defy professional limitations, while explaining in brief and for a legal audience the different conceptual devices on which they continue to rely.

As a result of the unusual set-up of the book—three principal authors, each paired off with one interlocutor—the book has a double structure: the principal authors in conversation with one another; and each principal author in conversation with an interlocutor: Caygill with Steuer, Kendall with Noll and Feldman

[7] F Johns, 'Data, Detection, and the Redistribution of the Sensible in International Law' (2017) 111 *American Journal of International Law* 57.

[8] R Labati and others, 'Biometric Recognition in Automated Border Control: A Survey' (2016) 49 *ACM Computing Surveys (CSUR)* 1; T Caldwell, 'Market Report: Border Biometrics' (2015) 2015 *Biometric Technology Today* 5; C Epstein, 'Embodying Risk: Using Biometrics to Protect the Borders' in L Amoore and M de Goede (eds), *Risk and the War on Terror* (Routledge 2008) 194; S Doyle, 'Drone Warfare: The Autonomous Debate' (2018) 13 *Engineering & Technology* 40; S Mansfield-Devine, 'Biometrics at War: The US Military's Need for Identification and Authentication' (2012) 2012 *Biometric Technology Today* 5–8.

[9] C Heyns and others, 'The International Law Framework Regulating the Use of Armed Drones' (2016) 65 *International & Comparative Law Quarterly* 791–827.

[10] J Petman, *Autonomous Weapons Systems and International Humanitarian Law: 'Out of the Loop'?* (The Eric Castren Institute of International Law and Human Rights 2017).

with Liljefors. Despite this double structure, or in addition to it, common themes and leitmotifs run through every chapter, and it is not hard to draw connections across any of the contributions. Algorithmic techniques of war-making, of course, make up the common objects of analysis. Within this broadly but clearly delimited analytical space, a space saturated in this book with a vocabulary of governance, one common theme explores the limits of human perspective as we know it—this is a situated we, assuming a perspective constructed under conditions associated with the late-Enlightenment west. Another common theme investigates the character of cybernetic intelligence predicated on information and signal strength in neural networks. These are just two prominent examples—there are more.[11] Despite the integration, however, each contribution maintains a distinct voice, and the balance of preoccupations changes from one to another. Below, I will schematically treat each chapter in turn, in their order in the book, but recommend reading the book as a whole (though that hardly needs to be linear). The next section, focusing on the chapters by Steuer and Caygill, sets the stage, framing the prosecution of war in a world defined by information technologies. The section thereafter, focusing on the chapters by Noll and Kendall, addresses the dilemmas posed as a matter of law in this emergent security environment. The section after, focusing on the chapters by Liljefors and Feldman, considers where the emergent technologies and norms appear to be leading. Finally, I offer some summary observations of my own in conclusion.

2. The security environment defined by information

Daniel Steuer sets a tone with the first chapter, entitled *Prolegomena to Any Future Attempt at Understanding Our Emerging World of War*, urgently critiquing a failure of critical reflection in global security relations, the failure precipitated by viewing the world as a system. The world viewed as a system is a world of information, one in which artificial intelligence is uniquely suited to operate. Steuer sets off the world of information with scare quotes, to distinguish it from a world that precedes it, thus 'world' and world, respectively. That division does a lot of work for Steuer, and exactly what sustains it could use further examination. But it allows Steuer to highlight mimetic dynamics in the field of international security, dynamics driven by competitive relations in the intertwined fields of defense and economy. The 'world' that is constituted by information technologies is a product and driver of competitive economic and security imperatives alike. Drawing largely on Mary Kaldor's work on new wars,

[11] One additional leitmotif is theology. It runs throughout the contributions and is prominent in the concluding observations, entitled *Visions*. Theology affords the contributors useful points of reference with respect to historical limits of human perception and intelligence, and the impact of those limits on systems of norms in political community. I found, though, that its prominence in the concluding observations was to the neglect of other worthy themes, which I focus on here.

competitive economic pressures are conjoined with the competitive pressures of new wars. Kaldor's work establishes for Steuer a diffuse and decentered environment of asymmetrical warfare among individuals, groups and states, all entangled with economic pressures while prosecuting war as partisans.[12] The partisan is the insurgent, the fighter who operates outside of traditional military institutions, in asymmetrical combat. But the mimetic character of competitive relations ensures that asymmetrical conflict produces a constantly expanding repertoire for waging war on both sides. Steuer adopts the notion of the partisan from Carl Schmitt's *Theory of the Partisan*, in which the partisan becomes the Napoleonic tool of great powers locked in totalizing conflict.[13] But Steuer further adapts the notion of the partisan with the help of Kaldor. With Kaldor, Steuer observes partisan combatants everywhere, locally and globally, but also technologically as well as geographically, extending the repertoire of warfare to commercial and digital spaces. The conflicts in which ubiquitous partisans are involved, however, have become transient things; the causes for which partisans fight are no longer absolute, but come in endless succession.[14] In keeping with the technological and economic character that suffuses the contemporary partisan conflict of new wars, conflicts are opportunistic and constantly changing, fragmentary, informal and inexhaustibly multiple.[15]

To apprehend this condition of 'global partisan warfare',[16] characterized by pervasive integration among spheres of conflict, security, technology and economic activity, Steuer turns to Deborah Cowen's research on *The Deadly Life of Logistics*, and the connection Cowen makes between economic management and military exercise.[17] Her work points to the ascendance of information as a military technology, which becomes a dominant theme of Steuer's chapter, and recurs throughout the book. In addition to Cowen, Steuer draws on scholars such as Paul Edwards and Philip Morowski for the ways in which information more broadly has become a dominant vocabulary of global governance, blending security and economic imperatives. Computational power over the world rendered as information becomes the sine qua non of competitive advantage or even viability. Certainly, this competitive dimension is not lost on Eric Schmidt and company at the NSCAI. As Sara Kendall will point out, this competitive dimension is partly temporal in nature, the faster the better. But this is not a race to find the one right answer. The AI technology at work here, subsymbolic AI, works by processing signal strength and by pattern recognition, recursively parsing data for multiple possible realities with multiple possible futures, to

[12] M Kaldor, *New and old wars: Organised violence in a global era* (Stanford UP 2012).
[13] D Steuer, 'Prolegomena to Any Future Attempt at Understanding Our Emerging World of War', in in M Liljefors, G Noll and D Steuer (eds), War and Algorithm (Rowman & Littlefield 2019) 12–13.
[14] ibid 13-14.
[15] ibid 14.
[16] ibid 13.
[17] D Cowen, *The Deadly Life of Logistics: Mapping Violence in Global Trade* (U of Minnesota Press 2014).

foreclose some futures and privilege others.[18] Sub-symbolic AI operates by correlating signals, not on the basis of positive truths about things in the world, but on the basis of cybernetic techniques to distinguish and link data points swept up in information technologies designed like neural nets. Ultra-rapidly, over and over, algorithmic warfare processes, produces and eliminates realities that emerge out of its information system.

The paradoxical consequence, according to Steuer, is 'a world that moves toward the ideal of brute presence.'[19] This suggestion lends a certain arc to *War and Algorithm*, when, in the final full chapter, by Feldman, the ideal of brute presence returns as the reality of dead bodies. In Steuer's chapter, however, the principal death is the death of critical reflection: the reductive immediacy of the world system, or world-as-information, is one that leaves no space for critique of the work done by weaponized deployment of artificial intelligence. And here I have both sympathy and reservations with respect to Steuer's contribution. The idealized immediacy of subsymbolic AI incorporated into governance routines seems a crucial site for critical attention.[20] That is my sympathy. My reservation is in the style. Steuer's argument is assembled out of small parts of many pieces of work. It is not clear how well they all really hang together. Steuer seems to try to overcome any doubts by heavy use of quotations. In places, it feels as though the argument is being advanced by collage.[21] Moreover, much of that collage comprises statements that demonstrate the urgency more than the coherence of Steuer's argument. This, however, had the odd effect for me of obscuring the actual stakes.

Howard Caygill's contribution, entitled *Anthropokenosis and the Emerging World of War*, takes off from the sense of unhinged conflict that permeates Steuer's chapter. In this vein, Caygill accepts an invitation to augment and extend Steuer's observations. The product, however, includes a critical challenge in the process of extension and augmentation. Caygill critiques Steuer's immersion in the Hobbesian vision that characterizes global partisan warfare, insofar as the immersion tends towards an implicit reproduction of the Hobbesian celebration of security.[22] Thus, Steuer's critical prolegomena arguably suffer for continuing 'to subscribe to a theoretical commitment to

[18] CF, L Amoore, *Cloud Ethics: Algorithms and the Attributes of Ourselves and Others* (Duke UP 2020); A Rouvroy, The End(s) of Critique: Data-Behaviourism vs. Due-Process', in M Hildebrandt and E De Vries (eds), *Privacy, Due Process and the Computational Turn. Philosophers of Law Meet Philosophers of Technology* (Routledge 2012) 157–82.

[19] ibid 24.

[20] D van den Meerssche and G Gordon, 'The Contemporary Values of Operadiction Regimes', in I Feichtner and G Gordon (eds), *Law and the Global Constitution of Values* (Routledge forthcoming).

[21] The 28 pages of text have 198 footnotes, some of them covering multiple quotations in series.

[22] H Caygill, '*Anthropokenosis* and the Emerging World of War' in M Liljefors, G Noll and D Steuer (eds), *War and Algorithm* (Rowman & Littlefield 2019) 54–55.

catastrophe avoidance or survival through risk management and ideology critique.'[23] On the basis of the catastrophic preoccupations at work in Steuer's chapter, Caygill's analysis suggests that elements of Steuer's critique are complicit in historical programs that Steuer means to criticize, programs born out of the catastrophic imaginary engendered by nuclear weapons. Those programs include NASA's earth systems theory and the RAND Corporation's development of cybernetic policy.[24] These programs, and the catastrophic imaginary that drives them, also mark a pivot point for Caygill's contribution, moving on from the security catastrophe associated with Hobbes, to the environmental catastrophe associated with the Anthropocene.

Caygill does not incorporate the Anthropocene uncritically. First, he sketches the genealogy and limits of the discourse of catastrophic thinking, including the cybernetic and world systems 'solutions' produced by the RAND Corporation and NASA, respectively, later engaged prominently by Gaia theory (most recently by network-oriented scholars including Bruno Latour).[25] Thus, 'the experience of the planet as a systematic whole was a condition of possibility of its coming into existence as an object on the verge of catastrophe.'[26] Caygill's point is not exactly to dispute the catastrophic situation; rather, '[t]he important point is that catastrophe is formulated in such a way that it can become survivable, that is, not entirely catastrophic.'[27] In short, catastrophic thinking, institutionally born out of security concerns prompted by the development of nuclear weapons, gave rise to specific logics and technologies of catastrophe avoidance, namely systems and cybernetic logics privileging information technologies. These supposedly remediating technologies now constitute the emerging world of war described by Steuer. Caygill proposes *anthropokenosis* as a corrective, which translates as a retreating world of the human.[28] From this angle,

> the threat to human autonomy posed by the violent implementation of systems of money, information, and energy in an emergent world of war needs to be supplemented by attention to wider changes in the composition of the global battlefield. It needs also to confront the potentially fatal strategic error of underestimating the threat of humanity not surviving its own civil wars and the implied struggle with the planet that hosts them.[29]

[23] ibid 57–58.
[24] ibid 59–64.
[25] ibid 58–64, relying on the work of J Hamblin, *Arming Mother Nature: The Birth of Catastrophic Environmentalism* (OUP 2013).
[26] ibid 64.
[27] ibid 61.
[28] ibid 54.
[29] ibid 69.

There is something telling, however, in this quote: all conflict is in the nature of civil war. Caygill's vision is at once anti-humanist, directed against the hubris of human-centric thinking, and yet redolent of the sort of progressive rhetoric that falls back on an ideal of undivided humanity in the face of all conflict. Caygill manages this tension with an intervention in perspective and scale, observing history from the vantage of geological time going back 540 million years. With this scale as an index, however, it is difficult to know what conclusions to draw from Caygill's critique. His corrective to catastrophic thinking is instructive, and the demonstration of the dual role that the RAND Corporation and the like have had—contributing to the current techniques of both war and remediation—is crucial. But while Caygill argues persuasively that the human is in retreat, who knows, on the scale of geological time to which he resorts, how long that will take? And in the meantime, the global conflicts engendered and fought with and over money, energy and information, conflicts that Caygill subsumes under civil wars, have more at stake than mere hubris.

3. Legal practice in the security environment defined by information

The next chapter, by Gregor Noll, entitled *War by Algorithm: The End of Law?*, focuses and takes further the question of cybernetic framing, to ask what 'the framing of autonomous weapons by cybernetics mean[s] for our ability to regulate them through law.'[30] The answer is refreshingly direct: 'It is not possible to subject algorithmic forms of warfare to the law.'[31] But to reproduce the direct answer at this stage is also a bit misleading on my part. Because as Noll makes his argument, he rejects the binary limitations that the question and answer presuppose, eg 'either man or machine, either within or beyond contemporary law.'[32] These binaries stymie us with a false choice: 'Do humans ultimately rule over technology or the reverse?'[33] Instead, Noll seems to be driving at a cyborg possibility, observing in contemporary weapons systems an 'amalgamation of machine properties with human properties in an open architecture in which none of them can be isolated from any other',[34] such that 'the rule of law may be related to the rule of algorithms in ways that cannot be reduced to a simple hierarchy.'[35] It is surprising, in this light, not to see Donna Haraway's or related work incorporated into this chapter or book.[36] Haraway and other

[30] Noll (n 4) 81.
[31] ibid 98.
[32] ibid 77.
[33] ibid.
[34] ibid 80.
[35] ibid 77.
[36] See, eg D Haraway, *Manifestly Haraway* (U of Minnesota Press 2016); R Braidotti, *The Posthuman* (Polity 2013); L Suchman, *Human-Machine Reconfigurations: Plans and Situated Actions* (Cambridge UP 2007).

feminist scholars have long been busy with elements of the larger research agenda that Noll proposes, surpassing the binary question and answer, namely, 'to map in detail how the way in which a human, a machine, and a piece of law are brought together with the world produces meaning.'[37]

But while Noll acknowledges an amalgamation of human and machine properties, he is not driving at additive synthesis. Fundamental features of both human law and the law of machines—cybernetics in Noll's analysis—cannot hold in the amalgamated state.[38] Why not? Roughly, because law in the tradition as Noll knows it is an elaboration of a mediate process, whereas cybernetics aspires to a direct operation. The tradition of law that Noll draws on is a monotheistic one, in which the law is divorced from any one incarnate being, codified instead in a text that must be studied, argued over and applied. Cybernetics, by contrast, begins with an incarnated model of the brain—the neural network—which runs a code from the outset. Study in the former (of law by humans) is replaced in the latter with training (running code on sample data), and the rest is execution. As observed earlier by Steuer, there is no comparable possibility for critical reflection in the latter as in the former. In place of critical reflection, there is a normative assumption at work, predicated on the analogy of brain and artificial intelligence (at least in its sub-symbolic variants). The presumptive rationality of the former (the brain) is imputed to the latter (the artificial intelligence modelled on a neural network). This takes on normative significance once AI produces knowledge products that the human cannot explain or reverse engineer, even in theory: 'The assumed rationality of the nature of the brain guarantees what the intentions of the programmer no longer can.'[39] The implicit normativity of the neural network drives the synthetic computational operation commonly known as pattern recognition. This becomes the terrain of war, at both micro and macro levels: 'On the micro level, AI applications involving artificial neural networks depend on there being such things as emergent properties [i.e., emergent patterns]. On the macro level, these emergent properties are extended into a form of war.'[40] In this situation, the world of information and sensory data available to the neural network becomes both matériel and objective, a reality by and for which war is fought.

The element of emergence—or the ability of artificial intelligence to draw actionable patterns, and so to create actionable worlds out of so much data—points to a seemingly mundane but crucial problem that Noll raises with respect to war-making with artificial intelligence: there is no time to test the technology. Or, perhaps more accurately, there is no time-out in which to test the technology. Noll draws an analogy with the dilemma once posed by interest in STARS, the US space-based defense system against nuclear weapons: 'There was no

[37] ibid 79.
[38] ibid 94.
[39] ibid 85.
[40] ibid.

sufficiently extensive space, featuring all the characteristics of our globe, for realistic testing. In AI warfare… it is time rather than the space we lack. In order to have an appropriate testing ground, it is not so much a parallel globe we would require as a parallel history.'[41] The recursive world-making operation of sub-symbolic artificial intelligence goes forward, creating the security conditions for its own reproduction. Lacking a 'time-out', the weaponized operation cannot be meaningfully reviewed, only applied and reapplied. Traditional law affords little opportunity to intervene, and changes in design will apply to a world already replaced by a next iterative emergence. In this sense, Noll suggests, the use of artificial intelligence in war is a gamble—an act of faith in the law of the cybernetic system—in which '[p]arts of the world, parts of its population, and a particular period in history are put into the wager.'[42] Recall Robert Work's quote for the NSCAI: recast as a wager rather than a hypothesis, the moral and humanitarian presuppositions look more like a gamble made with house money.

Sara Kendall's contribution, entitled *Law's Ends: On Algorithmic Warfare and Humanitarian Violence*, circles the binary contested by Noll, in which law either limits LAWS in traditional fashion, or in which LAWS are a law unto themselves. Playing on the subtitle of Noll's chapter, inverted into counterpoint for her own, Kendall stages the binary according to two ends of law: its limit (Noll's title), and its aim (Kendall's). The limit is the point where law stops; the aim is its telos.[43] The contested binary, in Noll's chapter, is bound up with the distinction between human and machine. By contrast, Kendall's contribution offers a different point of departure. She cabins the post-human question by asking, without answering, 'What would legal subjectivity look like beyond the human?'[44] Rather than speculate about that future, Kendall refocuses the inquiry by grounding it in a material history of immiseration and domination, achieved with and through international and humanitarian law. In this context, in which the law is an instrument of the violence it would regulate, LAWS are not law's end, but its continuation.

If Noll's forward-looking chapter emphasizes the enormity of the stakes, Kendall's chapter emphasizes how to engage them now. For all of the political urgency throughout the chapters, Kendall's almost singularly suggests a tangible political program. She stages her intervention on the legal-technical terrain of the blink, riffing on Brian Massumi's use of the term.[45] Operating in the blink is a way of preempting possible futures and even preempting deliberation over them. Preemption, of course, is also the controversial legal grounds for self-

[41] ibid 86.
[42] ibid 89.
[43] S Kendall, 'Law's Ends: On Algorithmic Warfare and Humanitarian Violence' in M Liljefors, G Noll and D Steuer (eds), *War and Algorithm* (Rowman & Littlefield 2019) 107.
[44] ibid.
[45] ibid 113–14, relying on B Massumi, *Ontopower: War, Powers, and the State of Perception* (Duke UP 2015).

defense likely to cover much of the resort to LAWS. Again, the technology is the continuation of violence prefigured in international law, for instance, in the 2003 Iraq War and the so-called Bush Doctrine of preemptive self-defense,[46] and so it is not to international law that Kendall turns for an alternative preemptive possibility. She turns instead to the preemptive capacity of the laboring humans necessary for the production of LAWS. Her example is the protest at Google that derailed the company's involvement in Project Maven, formally known as the Algorithmic Warfare Cross-Function Team.[47] Project Maven is the first major US Defense Department program to develop AI technologies for 'actionable intelligence'.[48] It bears noting that two of the main figures responsible for advancing Project Maven were Robert Work (then at the US Department of Defense) and Eric Schmidt (then at Alphabet), now Vice Chair and Chair of the NSCAI. Kendall proposes the alternative preemptive possibility on ethical grounds. The turn to ethics follows from the recognition that even if international law were to be capable of addressing LAWS, it is already inscribed with—and so is already enacting—the violence that it would constrain. This is a function of the history of colonial violence in which public international law and humanitarian law alike are steeped.

As the most politically grounded of the contributions to the book, Kendall's occupies a central place. Her chapter is not only in dialogue with Noll's, but connects productively with each of the other chapters, as well. As one example of the ongoing history of international law's violence, Kendall points to arguments of 'contingent sovereignty', arguments that suppress sovereign equality under international law for hierarchical relationships defined by military capacity.[49] Kendall's attention to the imperial dynamics of subordinating sovereignty to capacity in security domains defined by global powers, lends postcolonial depth to Steuer's concern for divisible sovereignty evident in global partisan warfare. And while Kendall engages Noll when she raises an 'uneven history and corresponding geographies of power', the same passage offers valuable contradistinction to Caygill's vast scale of geological time—Kendall's material history makes legible the ways in which 'contemporary drone warfare has reinscribed colonial logics', logics that are obscured in the vast sweep of *anthropokenosis*.[50] Anticipating a reference that Liljefors will make, Kendall points to Hannah Arendt's observations about the ambition to achieve an Archimedian

[46] S Murphy, 'The Doctrine of Preemptive Self-Defense' (2005) 50 *Villanova Law Review* 699–748.

[47] US Deputy Secretary of Defense, 'Establishment of an Algorithmic Warfare Cross-Functional Team (Project Maven)' (26 April 2017) <www.govexec.com/media/gbc/docs/pdfs_edit/establishment_of_the_awcft_project_maven.pdf> accessed 16 August 2021; C Pellerin, 'Project Maven to Deploy Computer Algorithms to War Zone by Year's End' *DOD News* (US Dept of Defense, 21 July 2017) <www.defense.gov/Explore/News/Article/Article/1254719/project-maven-to-deploy-computer-algorithms-to-war-zone-by-years-end/> accessed 16 August 2021.

[48] Kendall (n 33) 114–15.

[49] ibid 110.

[50] ibid 111.

point, one which would erase the human in the aim of advancing or securing humanity with science.[51] But Kendall's chapter reminds that erasure does not apply (or is not applied) equally to all. A related point, applied to political community, speaks to themes that Feldman later takes up, concerning the ways in which states have adopted technological practices that have undone the integrity of the sovereign. This disintegration of the sovereign, however, is part of a long and specific history of deliberate violence, resulting in a world that, in Kendall's words, remains 'divided between states that are able to exert control over their territories and others that struggle, often for reasons tied to the residues of colonial governance structures and continuing economic exploitation.'[52] On this basis, Kendall points out that '[t]he experiment of LAWS will likely play out to the benefit of the former upon the territory of the latter, much as some populations are made to suffer the collective punishment of armed drone activity in their territory.'[53] And this brings me back around again to the starting point of this essay. Just as an experiment with LAWS will not properly test a humanitarian hypothesis, nor will the effects of the experiment be felt equally in the Global South and North.

4. Perspectives on policy futures

The chapter by Liljefors, entitled *Omnivoyance and Blindness*, develops its argument in at least three different ways: with images, with a parable and with scholarly exposition. In the parable and a sequence of images, a lens is pulled back, elevated and withdrawn to include ever more within its gaze, until it ends by encompassing earth from outer space. The sequence of images begins with Gabriel Orozco's *Island within an Island*, featuring a doubled but grounded perspective of lower Manhattan, and concludes with NASA's Blue Marble photograph of the earth. The images in between exhibit progressively more elevated vantage points, including images overlooking the devastation of Dresden and Hiroshima. Liljefors, however, also bookends the sequence. At one end is Hieronymus Bosch's *The Seven Deadly Sins and Four Last Ends* (1505–1510), exhibiting the regime of the panopticon, which Liljefors means to distinguish from contemporary security apparatuses deploying artificial intelligence. At the other is a pair of images: Friedrich's *Wanderer above the Sea of Fog* (1817), and a photograph by Gilles Mingasson (2012) of a drone pilot and drone sensor operator practicing at a simulator comprising two chairs before a wall of screens. Friederich's painting, long a token of the sublime and the vision of a situated desire to transcend an inaccessible vastness, is the same that once adorned the cover of Terry Eagleton's *The Ideology of the Aesthetic*.[54]

[51] ibid 114.
[52] ibid 113.
[53] ibid.
[54] T Eagleton, *Ideology of the Aesthetic* (Blackwell 1990).

Mingasson's photo captures a different desire, fractured, depthless, but more immediately and apparently efficacious in its lethal power and global reach.

Mingasson's photograph exhibits for Liljefors a product of 'technovision', or a technologically mediated mode of seeing that blinds in equal proportion to the degree that it enhances vision.[55] Liljefors describes three stages of technovision blindness.[56] First, blindness of lost perspectives, like a person looking through binoculars, losing width of sight to see at a greater distance. Second, blindness to the technology that delivers enhanced sight, so that the mediating operation of the technology itself becomes opaque. This appears to approximate the current incorporation of AI and surveillance technologies into institutions of global governance, and coincides with recent observations like Fleur Johns's description of international law's new, data-driven sensorium, one in which the particular work done by information and communication technologies is easily overlooked.[57] The third mode of technovision blindness entails a blindness to blindness itself, or a total failure of perspective arrived at with the pretension to see everything all at once. Liljefors refers to this last stage as omnivoyance. Its distinction from the panopticon is instructive: whereas the panopticon operates according to a singular perspective, omnivoyance incorporates all sightlines at once. Its scopic technology represents no one perspective. With the loss of perspective, comes the loss of relational space. In such relationless space, lacking all perspective, 'the human being is *ex-plained*—mapped entirely as information and, in that process, emptied of depth, leveled out.'[58] This situation applies to both operators and objects of drone surveillance and warfare, elements in a depth-less assemblage, as depicted in Mingasson's photograph. And it is the condition, Liljefors suggests, of the world of information—or the world as information—by and upon which LAWS will operate. Liljefors' point is the lawyer's concern, raised by Noll: it is hard to comprehend what remains intelligible of the legal project in a space where all perspective is lost. Proportionality, for instance, appears little more than an empty gesture in this assemblage.

Allen Feldman's contribution, *Of the Pointless View: From the Ecotechnology to the Echotheology of Omnivoyant War*, picks up from Liljefors's omnivoyant technovision. Feldman describes the coproduction of the surveillance apparatus necessary to algorithmic warfare together with the subject that it governs. In this sense, Feldman's chapter poses a challenge to the reader, interrogating our participation in the technologies of algorithmic warfare. Feldman does this, perhaps counterintuitively, through a discussion of Nicolas de Cuza's 15th century text, *de Visione Dei*. De Cusa's text concerns an icon, hanging on a wall, that appears to follow a viewer with its eyes. But more than that, it follows all viewers at once, wherever they go. Unlike with the panopticon, however, the

[55] M Liljefors, 'Omnivoyance and Blindness' in M Liljefors, G Noll and D Steuer (eds), *War and Algorithm* (Rowman & Littlefield 2019) 128.
[56] ibid 146.
[57] Johns (n 7).
[58] Liljefors (n 44) 156 (emphasis in original).

icon is uncanny precisely because each viewer can see it seeing back, and because each viewer can also see other viewers seeing the icon as it sees back. It is by this mutual interrelationship of multiple viewers with one another and with the icon, that the icon assumes its power: 'A global eye relays back to the finite seeing subject the subject's own glance as a component of a governing omnidirectionality.'[59] This relay enrolls the seeing subject in the operation of the surveillance regime, dispersing its power, or 'presenting a world upon which any locus is a possible center.'[60]

The religious icon also allows Feldman to contextualize the contemporary surveillance assemblages of algorithmic warfare within a frame of Foucauldian pastoral power and revelation. The notion of pastoral power draws on the metaphor of shepherd and flock, to emphasize the relations of supervision and guidance, and with it the imperatives of visibility and acquiescence.[61] Thus Feldman situates contemporary surveillance assemblages in a longer history of governmental aspirations to omnivoyance keyed 'to the act and power of revealability'.[62] The specificity of the contemporary regime lies in the particularities of its technology, including what and how that technology reveals. To begin with, the technology 'is contingent on data compression dictated by remote-sensing bandwidth limitation.'[63] But compression has a paradoxically maximalizing function: 'Compression demarcates the minimal level of data required to generate the maximal globalizing effect, as in drone signature strikes based on elliptical yet enveloping metadata.'[64] Compression relies on cuts, which Feldman calls discretization: 'Discretization is a censoring system; it is the elliptical assemblage of an archive through the spacing of subtraction.'[65] A continuous flow of information from so many sensory inputs is reduced into so many discrete and differentiated data points, which can be combined and recombined into constantly updated data sets 'that enable pattern recognition and rule discrimination [to] systematize and prognosticate surveilled spaces and behaviors.'[66]

The process produces actionable information: 'Here beings are discretized … into data sets in order for these data sets to be acted upon as if they were the things themselves.'[67] Echoing Steuer, Feldman's formulation suggests that actionable information comes to supplant a reality to which it is supposed to apply, a point that I will return to in just a moment. By definition, however, compression must include loss, echoing Liljefors's point that enhanced vision

[59] A Feldman, 'Of the Pointless View: From the Ecotechnology to the Echotheology of Omnivoyant War' in M Liljefors, G Noll and D Steuer (eds), *War and Algorithm* (Rowman & Littlefield 2019) 177.
[60] ibid 178.
[61] ibid 184–85.
[62] ibid 185.
[63] ibid 171.
[64] ibid.
[65] ibid 172.
[66] ibid 171.
[67] ibid 172.

entails a corresponding blindness. This element of loss might point to life at the margins—the spaces, times and experiences that might still escape algorithmic governance. Feldman, however, points out the threat posed by algorithmic warfare to that marginal domain of life: 'In digital warfare, the incomputible [is] remediated as "collateral damage" – the algorithmic definition and disavowal of indiscrete violence, that which falls outside the computational continuum.'[68] Collateral damage categorizes away the excessive violence of actionable intelligence: 'the ruins and corpses, as the surplus damage of a signature strike, are irreversible finalities that do not reassemble themselves through recursion.'[69] But it is not just an actuarial trick: the maximalizing pretension of algorithmic warfare includes the erasure of its own excess violence as part of the solipsistic integrity of its operation. I noted a moment ago that the acted-upon information in Feldman's depiction recalls the reality of Steuer's world as (information) system, or 'world'. Carrying that theme to its conclusion in the book, Feldman emphasizes how acted-upon information becomes an end in itself:

> [O]minvoyant globalization is a scopic drive that falls short of world totalization, though not self-totalization, through its didactic presentation as a regime of truth that claims to secure ultimates – life, death, and security itself. Ominvoyance becomes its own recursive historical object and telos as opposed to the world it claims to encapsulate and reorder as its supportive scaffolding.[70]

Feldman's chapter, I note, is dense and jargony. It suffers from something like the compression that he observes in the surveillance apparatus of algorithmic warfare. Its resolution into Foucauldian pastoral power seems hasty and incomplete after the provocations of the analysis. But Feldman offers at least one trenchant take-away, in addition to the provocative analysis. The take-away relates to the title. The pointless view is a decentered one, not assimilable to any one human subject, while encompassing potentially all of them. But Feldman also demonstrates that algorithmic warfare is not without any point. The technical point of the scopic apparatus of global algorithmic warfare is the kill box, that terminal space containing the targeted life.[71] When the kill box constitutes the point of the system, death is the engine of its reproduction.

5. Emerging patterns in practice

AI does not traffic only and ever in death, and the weaponization of AI is hardly the first system mobilized to kill. What, then, distinguishes AI from other

[68] ibid 173.
[69] ibid.
[70] ibid 166.
[71] ibid 169.

technologies for war? These chapters point to a number of specificities. Let me address in conclusion one overarching distinction. Throughout all of the chapters, the term 'emergence' reappears regularly. We read about an emergent technology in an emergent world of war. There is a double meaning at work. The technology remains in development, its world of war still coming into view. But also, the technology relies on emergence, deploys it as part of a reiterative and recursive process. Emergence in this latter sense is related to immanence, the multiplicity of latent and mutable possibilities in a complex data set subject to a constant recombinant action of probabilistic calculation and recalculation. The point of probabilistic reasoning is to define possible worlds. To make probabilistic calculation actionable, is to use the definition of possible worlds to determine the one that is lived. The immediacy ascribed to AI refers to its power, as part of a larger assemblage of sensors and information technologies, to identify, over and over again, a constantly emergent, immanent reality. In this sense, weaponized AI can be reduced to three simple steps: pattern recognition defines possible worlds; risk analysis prospectively separates out favored worlds from disfavored; kill boxes destroy the disfavored. The ultimate moment of materialization is the moment of death—but the ultimate moment of materialization is also just another data point, for reentry into the next reiteration of the probabilistic logic. Subsymbolic AI, weaponized, works as part of a far-flung apparatus that is nonetheless specific, comprising people and things like cables, satellites and sensors. As pointed out by Feldman, the overall assemblage builds actionable worlds out of limited bits of data. On the basis of its particular build and the particular data that flow through it, however, that apparatus goes on redefining possible worlds in emergent patterns, prospectively analyzing for new risks among them, killing the emerging threat—and the humans and worlds that might emerge with it—in each next reiteration of actionable intelligence.

The network of information technologies and security apparatuses at issue here is widespread. In addition to the exceedingly brief list just above, there are technicians, power stations, engineers, clocks, project managers, guns, soldiers, screens and lawyers, among many other things.[72] To echo Liljefors, it is difficult to keep the entirety of it in perspective; to echo Noll, this makes the lack of a testing ground deeply problematic. The stakes are enormous, but competitive logics only serves to expand the remit of the information technologies and so expand the volumes of information that drive the new security assemblages. To cope with the challenges, in the practices of international law and relations, there has been increasing adoption of techniques learned from information science and business management studies, techniques that aim to maximize the resilience of social, political and technical systems.[73] These techniques

[72] For exemplary work analyzing such an assemblage, see G Sullivan, *The Law of the List: UN Counterterrorism Sanctions and the Politics of Global Security Law* (CUP 2020).

[73] Cf, D Chandler, *Resilience: The Governance of Complexity* (Routledge 2014); F Johns, 'From Planning to Prototypes: New Ways of Seeing Like a State' (2019) 82 *The Modern Law Review* 833–63; D van den Meerssche, Dimitri and G Gordon, '"A

embrace probabilistic reasoning in the service of risk management as an efficacious mode of legal and political governance.[74] But it is not clear whether such techniques address the problems raised by the emerging world of war, or whether they are part of the production of that world. I return one last time to the assertion made by Robert Work, on behalf of the NSCAI, that it is a moral imperative for the US to pursue the hypothesis that LAWS constitute a humanitarian good. As Noll made clear, this is not really a testable hypothesis. Single cases may be examined to calibrate the system to favor this variable or that, but meanwhile, the overall operation goes on, world-making by world-ending, over and over. There are no parallel histories by which to test the world it makes against the ones it will have destroyed. There is only a constant reiteration of probabilities, so many outputs generated by subsymbolic AI at work in particular though far-flung assemblages, which are made to see some things and not others. What Work calls a moral imperative is in fact a policy preference, one that favors the power to destroy worlds over the power to resist their destruction. About this latter possibility, I close with a quote from the very end of *War and Algorithm*:

> In order to resist, we must slow things down enough to be able to act rather than reflexively react. We must take the time to insist on judging the proportionality of our deeds and on critically assessing the degree to which they truthfully and impartially reflect our shared world. We should ask ourselves, can we still cultivate our imagination into compassion so that we may encounter the Other's face as an inviolable limit, the very precondition for our ability to recognize violence? That would mean to refuse to yield to the authority of the algorithm and thereby to the economic–political authority that draws its legitimacy from it.[75]

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[74] See, eg the special issue on *Security, Technologies of Risk, and the Political*, edited by C Aradau, L Lobo-Guerero and R van Munster, in volume 39 of *Security Dialogue* (2008)including: M Dillon, 'Underwriting security' (2008) 39 Security dialogue 309-332; R Diprose, et al. 'Governing the future: The paradigm of prudence in political technologies of risk management' (2008) 39 Security Dialogue 267-288; M de Goede, 'Beyond risk: Premediation and the post-9/11 security imagination,' (2008) 39 Security Dialogue 155-176; O Kessler and W Werner, 'Extrajudicial killing as risk management' (2008) 39 Security Dialogue 289-308; G Mythen and S Walklate, 'Terrorism, risk and international security: The perils of asking "what if?"' (2008) 39 Security dialogue 221-242; M Salter, 'Imagining numbers: Risk, quantification, and aviation security' (2008) 39 Security dialogue 243-266.

[75] M Liljefors, G Noll and D Steuer, 'Visions' in M Liljefors, G Noll and D Steuer (eds), *War and Algorithm* (Rowman & Littlefield 2019) 203.