LEGAL JUDGMENT DAY FOR THE RISE OF THE MACHINES: A NATIONAL APPROACH TO REGULATING FULLY AUTONOMOUS WEAPONS

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This Note advocates that the U.S. Congress pass laws restricting the development of fully autonomous weapons. These "killer robots" have their advocates, but this Note contends that they also present legal, geopolitical, and military risks that outweigh any potential benefits. Because fully autonomous weapons will not be able to comply with the international norms of the laws of armed conflict, the U.S. government should pass laws banning the use of such weapons, and it should encourage the international community to do the same.

TABLE OF CONTENTS

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INTRODUCTION

The U.S. military now uses unmanned "drone" aircraft that can destroy enemy targets or combatants, despite the fact that the "pilot" is sitting a continent away. The advent of these unmanned weapons is one of the most transformational and controversial military developments in recent decades.[1] What many Americans may not realize is that drones may be only the first step in the next major stage of military technology.[2] If current research and technological efforts continue, militaries will possess not only semi-autonomous weapons such as drones, but also fully autonomous weapons ("FAWs") which conduct missions based on preset programming rather than on constant human input and control.[3] These so-called "killer robots" probably do not yet exist (at least, no nation has publicly acknowledged possessing them), and may seem reminiscent of science fiction.[4] Nevertheless, militaries around the world, including the U.S. military, are already in the process of developing them.[5] Opponents of FAWs believe that such weapons will violate international humanitarian law, but FAW defenders claim that they could comply with laws of conflict, and could even reduce the human costs of warfare.

This Note considers the legal, geopolitical, and military implications of FAWs, and reaches the conclusion that the disadvantages of these weapons outweigh the advantages. FAWs should be subject to legal regulations limiting their proliferation and deployment in warfare, joining other suspect classes of weapons such as nuclear, chemical, and biological weapons. This Note does not propose new legal restrictions upon semi-autonomous weapons (although valid concerns exist with respect to such weapons as well);[6] it instead focuses on the unique problems that occur when humans relinquish direct supervision over weapons of war.

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1. Gary E. Marchant et al., *International Governance of Autonomous Military Robots*, 12 COLUM. SCI. & TECH. L. REV. 272, 273 (2011) (noting that robotic military systems including fully autonomous weapons "raise a number of potential operational, policy, ethical and legal issues").

2. Michael N. Schmitt & Jeffrey S. Thurnher, *"Out of the Loop": Autonomous Weapon Systems and the Law of Armed Conflict*, 4 HARV. NAT'L SEC. J. 231, 235–37 (2013) (noting that the United States and other nations have semi-autonomous weapons, and that the United States does not yet have, but is currently developing, fully autonomous systems).

3. *See generally* HUMAN RIGHTS WATCH, LOSING HUMANITY: THE CASE AGAINST KILLER ROBOTS 1 (2012) [hereinafter HRW].

4. *Id.* (discussing FAWs as "killer robots"); Schmitt & Thurnher, *supra* note 2, at 237 ("Operational realties will likely drive the United States to discard its practice of keeping a human in the loop for lethal targeting decisions.").

5. HRW, *supra* note 3, at 3 ("The examples described in this report show that a number of countries, most notably the United States, are coming close to producing the technology to make complete autonomy for robots a reality and have a strong interest in achieving this goal."); Benjamin Kastan, *Autonomous Weapons Systems: A Coming Legal "Singularity"?*, 2013 U. ILL. J.L. TECH. & POL'Y 45, 52 (noting militaries' efforts to develop FAWs).

6. *See* HRW, *supra* note 3, at 46.

This Note recommends that the United States lead an international effort to restrict FAWs. Despite the common perception that the United States has experienced a decline in global influence over the past two decades, the United States nevertheless remains the dominant military and economic superpower and has superior capacity to develop FAWs. The United States should pass national legislation restricting FAWs, and is well-positioned to lobby the international community to take action as well. However, because of pressure from pro-FAW interest groups, it will likely take a national social movement and news-media coverage of the issue for the effort to restrict FAWs to succeed. Despite the difficult road to reform, the time to act is now.[7] Instituting limitations may be much more difficult when FAWs have already been constructed and incorporated into the military arsenal and strategic plans of the United States and other nations.[8]

I. "I, FOR ONE, WELCOME OUR NEW KILLER ROBOT OVERLORDS": ARGUMENTS IN FAVOR OF FULLY AUTONOMOUS WEAPONS

FAWs have their defenders, who wield a number of strong arguments. Their positions are documented here, and counterarguments and rebuttals are offered in Parts II–IV of this Note.

FAW proponents' first main argument is that—perhaps counterintuitively—taking humans out of the battlefield equation could lead to more humane results.[9] This conclusion is based on three contentions. The first, and perhaps most obvious claim, is that the development of FAWs will reduce the number of military personnel killed or wounded in war.[10] Taking human soldiers off of the battlefield means fewer widows, orphans, and wounded veterans. This advantage also exists for semi-autonomous weapons such as drones, and therefore is less unique to FAWs than the next two arguments.[11]

The second key argument that FAWs could be better than humans at complying with laws of conflict is centered on their superhuman capabilities.[12] Their proponents claim they would be equipped with sensors that would enable them to distinguish between enemy soldiers and innocent civilians better than humans can (a point strongly disputed by FAW opponents).[13] FAW advocates

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7. Marchant et al., *supra* note 1, at 314–15 (arguing that urgent action is needed to create a legal governance regime for FAWs, because doing so will be more difficult once the technology becomes entrenched).

8. *Id.*

9. Kastan, *supra* note 5, at 62 (suggesting that FAWs were created in order to reduce "unnecessary suffering both of friendly troops and civilians").

10. HRW, *supra* note 3, at 3 (describing reduced risk to soldiers as one reason militaries are pursuing FAWs).

11. *See* Marchant et al., *supra* note 1, at 274.

12. *Id.* at 279 (suggesting that FAWs may do a better job than humans of overcoming "the fog of war" and making good decisions).

13. Kastan, *supra* note 5, at 48; Schmitt & Thurnher, *supra* note 2, at 247 ("Even software for autonomous weapons systems that enables visual identifications of individuals, thereby enhancing accuracy during autonomous 'personality strikes' against specified persons, is likely to be developed.").

claim that the machines' high-tech perception abilities will mean fewer tragic mistakes on the battlefield.[14]

A third claim of FAW proponents is that FAWs would be able to act with a superior level of caution and rationality because they will be unencumbered by human emotions such as panic and fury.[15] The sense of paranoia and desire for vengeance that has contributed to war crimes by militaries in the past (such as the My Lai Massacre during the Vietnam War[16]) would not exist in an emotionless robot.[17] FAWs will also lack a self-preservation instinct,[18] supposedly allowing them to defer engagement, even at the risk of destruction, if they are unable to determine that someone is not a civilian.[19]

A fourth major category of argument in favor of FAWs emphasizes their military effectiveness and inevitability.[20] Because these weapons could respond to stimuli and make decisions with superhuman speed, taking humans out of the loop could constitute a military advantage, with benefits to the national security of any nation that could use such weapons.[21] As was the case with nuclear weapons, the clear military advantage such weapons bring (even if they are philosophically or morally objectionable) could make their development a near inevitability.[22] Any

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14. Kastan, *supra* note 5, at 60 (noting that the difficulty humans have in distinguishing between combatants and noncombatants has caused tragic accidents resulting in casualties).

15. Marchant et al., *supra* note 1, at 280 ("They can be designed without emotions that cloud their judgment or result in anger and frustration with ongoing battlefield events.").

16. *See* ROBERT MANN, A GRAND DELUSION: AMERICA'S DESCENT INTO VIETNAM 648–49 (2001).

17. HRW, *supra* note 3, at 28 (summarizing Ronald Arkin's argument that FAWs would have the advantage of not being affected by "anger or fear" (citing RONALD ARKIN, GOVERNING LETHAL BEHAVIOR IN AUTONOMOUS ROBOTS 29–30 (2009))); Schmitt & Thurber, *supra* note 2, at 249 ("Although emotions can restrain humans, it is equally true that they can unleash the basest of instincts. From Rwanda and the Balkans to Darfur and Afghanistan, history is replete with tragic examples of unchecked emotions leading to horrendous suffering.").

18. It is quite possible, however, that militaries would instead choose to program FAWs to *have* a self-preservation instinct in order to avoid massive losses of highly expensive military devices.

19. *See* HRW, *supra* note 3, at 37 ("[FAW proponents] also note that robots can be programmed to act without concern for their own survival and thus can sacrifice themselves for a mission without reservation."); Schmitt & Thurnher, *supra* note 2, at 262–64 (noting that FAWs are not constrained by self-preservation and may be obligated to resolve any doubt as to an individual's status by treating that individual as a civilian).

20. Kastan, *supra* note 5, at 54 (emphasizing the military advantages of FAWs).

21. *Id.* ("Most importantly, [FAWs] would be militarily useful if they can successfully compress the targeting process.").

22. Schmitt & Thurnher, *supra* note 2, at 238 ("Future combat may . . . occur at such a high tempo that human operators will simply be unable to keep up.").

country left behind in a FAW "arms race" could be at a military and strategic disadvantage, and thus lose standing and influence in the world.[23]

The final argument made by opponents of legal restrictions on FAWs is that these weapons do not create many new problems different from those that exist with currently extant weapons systems.[24] Accordingly, FAW proponents suggest that it would be unnecessary or even reckless to create new restrictions, because the current legal regime can address any concerns regarding FAWs' compliance with international law.[25] On a related note, FAW advocates also claim that the uncertainty about these technologies' capacity to adhere to the laws of war makes any sweeping international moves (such as a global ban on FAWs) premature reactions based on insufficient scientific data.[26]

FAW opponents, on the other hand, are far more skeptical of these weapons' ability to comply with current international legal norms. They contend that the legal, geopolitical, and military problems presented by FAWs justify the creation of a legal regime to curtail their development and proliferation.

II. BEING A ROBOT MEANS NEVER HAVING TO TELL THE JUDGE YOU'RE SORRY: LEGAL PROBLEMS WITH THE USE OF FAWS

Critics of FAWs claim that the weapons create unique problems because they may be unable to comply with international humanitarian law.[27] The first category of objections has to do with whether FAWs will be inherently unable to follow international laws of conflict sufficiently, and the second has to do with the problem of assessing legal accountability if FAWs do violate such laws. Critics, most notably the nonprofit organization Human Rights Watch, have argued that FAWs could not reliably follow the rules of distinction, proportionality, and military necessity present in current international law standards.[28] Distinction

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23. Marchant et al., *supra* note 1, at 275 (suggesting that, in a global military environment dominated by FAWs, nations reliant upon "relatively slow human decision-making" would be at a distinct disadvantage).

24. *See* Kastan, *supra* note 5, at 56 (asserting that all new weapons systems are already reviewed by military lawyers to ensure that they comply with national and international laws).

25. *Id.* at 48 (suggesting that FAWs will be just as accountable as other military weapons systems once a legal "standard of care" is established); *see also* Schmitt & Thurnher, *supra* note 2, at 273 (asserting that legal challenges presented by FAWs are "substantively similar" to those of other modern weapons systems).

26. Kastan, *supra* note 5, at 64 ("Since [FAWs] cannot be legally deployed until technology matures a great deal further, calls for banning such weapons in the interim are unnecessary."); Schmitt & Thurnher, *supra* note 2, at 233 (contending that a ban on FAWs would be bad public policy).

27. HRW, *supra* note 3, at 1–2 (arguing that FAWs could not meet legal standards of international humanitarian law); *see also* Kastan, *supra* note 5, at 54–55 (providing an overview of major sources of the law of armed conflict).

28. HRW, *supra* note 3, at 3; *see also* Kastan, *supra* note 5, at 58 ("[T]echnological development will need to progress before [FAWs] will be . . . legally permissible under the principles of military necessity, discrimination, proportionality, and humanity.").

refers to the ability to distinguish between combatants and noncombatants;[29] proportionality involves the duty to avoid military responses that endanger civilians if they are significantly out of proportion to a military threat;[30] and military necessity is the duty to engage only in such military actions as are necessary to achieve legitimate military objectives.[31]

Furthermore, although FAWs are probably not yet developed, their use may already be restricted under current international humanitarian law.[32] Much of this controversy involves a philosophical debate about issues such as whether FAWs' abilities to distinguish between legitimate combatants and civilians in a complex environment will be subhuman or superhuman.[33] Opponents of FAWs suggest that a robot might struggle to distinguish between an armed combatant and a teenaged civilian with a toy gun, for example.[34] And while FAW proponents argue that the lack of human emotions like fear and anger makes FAWs less likely to commit war crimes,[35] FAW opponents suggest robots' lack of human empathy makes them more likely to act with disregard for human life.[36]

One issue that FAW critics highlight more than proponents of these weapons is the possibility of a "glitch" that causes FAWs to do damage outside the targeted parameters of their military mission.[37] When such an eventuality occurs (as it almost certainly will with a fallible emerging technology),[38] the question is: who will be held responsible for damages and injuries?[39] One possibility would be

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29. HRW, *supra* note 3, at 30.

30. HRW, *supra* note 3, at 32; Marchant et al., *supra* note 1, at 296.

31. *See* HRW, *supra* note 3, at 34–35; Marchant et al., *supra* note 1, at 296.

32. HRW, *supra* note 3, at 21–24 (suggesting that FAWs may not comply with the requirements of Additional Protocol I to the Geneva Conventions). Critics also call for a specific international treaty to prevent the development and production of FAWs, as has been done with other categories of suspect weapons. *See id.* at 5.

33. Kastan, *supra* note 5, at 59 ("The inability to discriminate between combatants and civilians is perhaps the greatest hurdle to the legal deployment of [FAWs].").

34. HRW, *supra* note 3, at 31–32 (suggesting that human soldiers, but not FAWs, would often possess the cultural context and emotional intuition necessary to tell the difference between children "playing soldier" and a genuine threat).

35. *Id.* at 37.

36. *Id.* ("Human emotions . . . also provide one of the best safeguards against killing civilians, and a lack of emotion can make killing easier. In training their troops to kill enemy forces, armed forces often attempt 'to produce something close to a 'robot psychology,' in which what would otherwise seem horrifying acts can be carried out coldly." (quoting JOHNATHAN GLOVER, HUMANITY: A MORAL HISTORY OF THE TWENTIETH CENTURY 48 (2000))).

37. *See id.* at 42 (noting the inevitability of FAWs eventually killing or injuring civilians if regularly deployed in combat situations); *see also* Marchant et al., *supra* note 1, at 283 (describing a "friendly fire" accident in which a semi-autonomous weapons system killed South African soldiers).

38. Kastan, *supra* note 5, at 65 ("[FAWs] are complex new systems, which . . . will fail at one point or another.").

39. *See* HRW, *supra* note 3, at 4 ("Given that such a robot could identify a target and launch an attack on its own power, it is unclear who should be held responsible for any unlawful actions it commits.").

the commander who deployed the FAW. The difficulty would be proving that the commander reasonably could have foreseen the negative outcome, which may be difficult to prove absent abundant evidence of prior problems with the given weapons system. [40] Another option would be holding the programmers accountable, but that might be tricky because machines as complex as FAWs are programmed by large teams of people.[41] Identifying which particular programmer is responsible for the glitch that led to civilian casualties might be very difficult.[42] The weapons manufacturer could be held responsible, in theory, but this is unlikely to happen because it is inconsistent with weapons manufacturers' traditional lack of liability under international laws of armed conflict.[43] Some have even suggested that the robot itself might be punished, which sounds absurd today, but may become plausible if major advances in artificial intelligence are made.[44] But this level of technology, if it is ever developed, remains the province of the distant future.[45] Critics fear that, in practice, ultimately no one would be held responsible, decreasing militaries' accountability for illegal actions done on the battlefield, and failing to deter further reckless use of FAWs.[46]

III. THE CYBER-LEVIATHAN: GEOPOLITICAL PROBLEMS WITH FAWS

Widespread use of FAWs could have unexpected consequences upsetting the geopolitical order in light of their likely influence on domestic politics, the stability of regimes, and the likelihood that states would choose a military option when pursuing their goals.

According to sociologist Max Weber's famous maxim, all nation–states rely upon a "monopoly of the legitimate use of physical force." [47] Political

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40. *Id.* at 43.

41. *Id.* (emphasizing individual programmers' inability accurately to predict how a FAW would respond under complex battle conditions); *but see* Schmitt & Thurnher, *supra* note 2, at 277 (arguing that programmers could be held responsible for faulty programming that led to FAWs committing war crimes).

42. Marchant et al., *supra* note 1, at 284 ("Now, programs with millions of lines of code are written by teams of programmers, none of whom knows the entire program; hence, no individual can predict the effect of a given command with absolute certainty . . . .").

43. HRW, *supra* note 3, at 44; *see also* Kastan, *supra* note 5, at 74.

44. Kastan, *supra* note 5, at 51 (arguing that proposals to punish robots for their own mistakes could be more feasible and persuasive than many analysts currently anticipate). For a fictional account of this type of scenario, *see also* BATTLESTAR GALACTICA: SCATTERED (Sci-Fi Channel Television Broadcast, July 15, 2005) (punishing Sharon Valerii, a humanoid FAW known as a "Cylon," by locking her in *Galactica*'s brig for perpetrating a friendly-fire incident).

45. Kastan, *supra* note 5, at 50 ("There are substantial debates in the robotics community regarding the likelihood of highly intelligent systems ever being developed.").

46. *See* HRW, *supra* note 3, at 44 ("Fully autonomous weapons . . . lack any emotion that might give them remorse if someone else were punished for their actions. Therefore, punishment of these other actors would do nothing to change robot behavior.").

47. KENNETH NEWTON & JAN W. VAN DETH, FOUNDATIONS OF COMPARATIVE POLITICS 22 (2010).

philosopher Thomas Hobbes famously observed that the residents of a nation benefit from the existence of a sovereign, for without any centralized authority, society exists in an anarchic state where life is "nasty, brutish, and short."[48] John Locke's subsequent vision of a "social contract" depicted the population of a nation submitting to the State in exchange for protection and good governance; if the sovereign broke his end of the bargain, however, the population could respond by overthrowing the monarchy and replacing it with one more inclined to fulfill social-contractual obligations.[49] This notion of popular sovereignty has become increasingly important to the international order over the past two centuries, because with the advent of mass conscription and democratic political institutions, governments of modern nation–states must maintain legitimacy with their citizenry in order to function and remain in power.[50] When a government loses legitimacy, it may no longer be able to mobilize its population in service of State goals such as continuing a war effort.[51] Division or rebellion within a military has often been an essential precursor to major revolution or regime change.[52]

With the development of FAWs, however, heads of State could control a powerful mechanized army, and therefore have little to fear from the populace. This situation may create a new level of internal stability for nations, but with the trade-off being that governments would have fewer incentives to maintain democratic accountability or pursue the common good as opposed to acting exclusively for the benefit and self-preservation of the leaders of the State. Human rights and freedom of expression could suffer in a world where automated militaries were the norm.[53] Robot troops would likely be unable to rebel or dissent, and they could be very useful in crushing any "subversive" actions by dissatisfied citizens. FAWs originally designed to distinguish between civilians and combatants could be modified to distinguish between "loyal" and "disloyal" citizens. The niceties of existing legal systems, such as due process of law, may not be respected in societies where the balance of power between the government and the governed is so one-sided.[54]

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48. THOMAS HOBBES, LEVIATHAN: OR THE MATTER, FORME AND POWER OF A COMMONWEALTH ECCLASIASTICALL AND CIVIL 108 (Gateway ed., Regnery Publishing 2009) (1651).

49. *See* EDMUND S. MORGAN, INVENTING THE PEOPLE: THE RISE OF POPULAR SOVEREIGNTY IN ENGLAND AND AMERICA 119–20 (1988).

50. *See* HRW, *supra* note 3, at 38 ("Even the most hardened troops can eventually turn on their leader if ordered to fire on their own people.").

51. For example, during the 1910s, Russia faced social unrest, economic turmoil, and political instability that eventually ended its involvement in World War I. *See* ROBERT SERVICE, A HISTORY OF MODERN RUSSIA: FROM NICHOLAS II TO PUTIN 30–33, 75–78 (2003).

52. For example, division within the Iranian military was a major causal factor allowing the Iranian Revolution of 1979 to occur. *See* BABAK GANJI, POLITICS OF CONFRONTATION: THE FOREIGN POLICY OF THE USA AND REVOLUTIONARY IRAN 113–17 (2006).

53. HRW, *supra* note 3, at 38 ("Fully autonomous weapons would . . . be perfect tools of repression for autocrats seeking to strengthen or retain power.").

54. Some may argue that in advanced countries such as the United States, the military is so technologically advanced and powerful that there is already a massive imbalance of power between the government and the governed. But, in such democracies,

The geopolitical stability gained by having fewer countries in revolutionary turmoil might be more than offset by the removal of incentives against military action to pursue political gains.[55] Military theorist Carl von Clausewitz famously observed that war is simply the "continuation of political activity by other means."[56] A major political deterrent to nations engaging in war is the cost in human lives and civilian morale, but with robots doing the fighting that concern is largely removed.[57]

Some might argue that if the realm of warfare could be limited to isolated or evacuated geographic locations where robot warriors duked it out with little risk to civilian lives, a world with more warfare might not be so terrible.[58] Yet this Note contends that a global increase in military confrontations would still be costly to human populations, given that money spent on robot wars by governments would not be available to meet more immediate human social needs. Furthermore, the sheer destruction and carnage likely to occur in mechanized warfare would likely have negative effects on the environment in a world where climate change is already a major concern.[59] These geopolitical problems present threats to global security and the international legal order.

IV. AUTOMATED DEATH MACHINES, WHAT COULD GO WRONG?: MILITARY PROBLEMS WITH FAWS

While FAWs may have military advantages (such as potential for superhuman decision speed), they create military vulnerabilities and legitimacy problems. First of all, while proponents tout the ability of FAWs to go beyond the capacity of human intelligence, in some ways they may still be inferior to the

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the military authority is to some degree constrained through supervision by popularly elected civilian politicians, and by the need to be able to convince human recruits to serve in a volunteer army.

55. HRW, *supra* note 3, at 40 ("The prospect of fighting wars without military fatalities would remove one of the greatest deterrents to combat."); Marchant et al., *supra* note 1, at 285 (noting that FAWs could make wars between states more likely (citing Peter Asaro, *How Just Could a Robot War Be?*, *in* CURRENT ISSUES IN COMPUTING AND PHILOSOPHY 1, 7–9 (Adam Briggle et al. eds., 2008))).

56. ANTULIO J. ECHEVARRIA, CLAUSEWITZ AND CONTEMPORARY WAR 5 (2007).

57. HRW, *supra* note 3, at 4 ("[R]elying on machines to fight war would . . . make it easier for political leaders to resort to force since their own troops would not face death or injury.").

58. *See* Kastan, *supra* note 5, at 61 ("[I]f there were ever a battlefield where no civilians were reasonably thought to be present . . . then a commander may be able to legally unleash [a FAW] in that area, even if it were not capable of distinguishing between combatant and civilian."). But, the likelihood of cordoning off battle to deserted areas is quite unlikely, given that strategic military imperatives tend to emphasize control of key cities and geopolitical regions.

59. *See* JAY E. AUSTIN & CARL E. BRUCH, THE ENVIRONMENTAL CONSEQUENCES OF WAR: LEGAL, ECONOMIC, AND SCIENTIFIC PERSPECTIVES 1 (2000) ("For centuries, military commanders have deliberately targeted the environment, seeking to obtain any possible advantage over their adversaries."). For a fictional version of environmental damage caused in a war between humans and artificially intelligent machines, see the hit film THE MATRIX (Warner Brothers 1999).

human intellect.[60] Robots, at least absent future advances in artificial intelligence, lack creativity and are simply restricted to following the dictates of their programming.[61] They also lack the ability to negotiate and develop relationships with human actors affected by the conflict.[62] The absence of a creative-thinking human inside the decision-making loop might actually be a strategic disadvantage on the battlefield.[63] Indeed, insurgents might repeatedly be able to exploit any blind spots discovered in a particular FAW model's "sensual and behavioral limitations."[64]

Second, as is a preeminent concern with nuclear weapons, it is possible that FAWs could fall into the wrong hands. While most states would likely use FAWs responsibly, programming them to comply with the laws of conflict, avoid war crimes, and minimize civilian casualties, terrorists who obtained FAWs might reprogram them to *maximize* civilian casualties.[65] While many terrorist groups might lack requisite technological sophistication (at least without a powerful State sponsor),[66] the risk of proliferation of FAWs to militant non-State actors is nevertheless a potential problem worth considering.

Another vulnerability is the potential ability of hackers working for a hostile nation or group to take control of the FAWs and turn them against the very army that deployed them, or against civilian populations.[67] The absence of a hacker-resistant override capacity would be especially damaging in these

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60. *See* Michael Copeland, *Where Humans Will Always Beat the Robots*, THE ATLANTIC (Oct. 22, 2013, 10:45 AM), http://www.theatlantic.com/business/archive/2013/10/where-humans-will-always-beat-the-robots/280762/ (finding that humans' group efforts in deciphering garbled information, as well as in social and cultural understanding, exceed the ability of supercomputers); Andrew McAfee, *The Kind of Work Humans Still Do Better Than Robots*, HARV. BUS. REV. (July 2, 2014), https://hbr.org/2014/07/the-kind-of-work-humans-still-do-better-than-robots/; HRW, *supra* note 3, at 29 ("Such a system presumes that computing power will approach the cognitive power of the human brain, but many experts believe this assumption may be more of an aspiration than a reality.").

61. While some cutting-edge robots are now capable of basic learning skills, such as figuring out how to cope with injuries, scientists are still a long way from creating machines with complex creative problem-solving abilities, if such technological advances even prove to be possible. *See, e.g.*, *Robot 'Learns to Keep Going with a Broken Leg,'* BBC NEWS (July 30, 2014, 7:08 PM), http://www.bbc.com/news/technology-28564349.

62. Marchant et al., *supra* note 1, at 285 (arguing that FAWs would be poorly suited for use in counterinsurgency efforts that require building trust with local populations (citing PETER W. SINGER, WIRED FOR WAR 299 (2009))).

63. *See* HRW, *supra* note 3, at 36 ("The development of autonomous technology should be halted before it reaches the point where humans fall completely out of the loop.").

64. *Id.* at 31 (citing ARMIN KRISHNAN, KILLER ROBOTS: LEGALITY AND ETHICALITY OF AUTONOMOUS WEAPONS 99 (2009)).

65. Marchant et al., *supra* note 1, at 305 (analyzing the significant threat of terrorists utilizing FAWs).

66. Kastan, *supra* note 5, at 63 (noting the technological hurdles that may make it difficult for groups other than advanced states to acquire FAWs).

67. Schmitt & Thurnher, *supra* note 2, at 242 ("The one real risk is tampering by the enemy or non-State actors such as hackers . . . . [T]he enemy might be able to use cyber means to take control of an autonomous weapons system and direct it against friendly forces or a civilian population.").

instances. The ability safely to disable malfunctioning devices is a major problem that semi-autonomous weapons system designers and advocates currently face.[68]

Some limitations of FAWs might be mitigated by the development of artificial intelligence ("AI"), which could make FAWs capable of making more complex battlefield decisions, and help them comply with international law.[69] Nevertheless, there is an inherent risk that AI could malfunction.[70] Proponents of FAWs equipped with AI claim that depictions of machines "going rogue" are unrealistic, dismissing them as the stuff of "Hollywood fantasies."[71] Yet there is no reason to be certain that hyper-intelligent or self-aware computer systems could not make decisions and take actions adverse to the interests of humanity.[72] Furthermore, there may be unexpected strategic downsides to delegating a large number of military decisions to AI-equipped automatic systems that lack human emotions; such robotic systems' lack of empathy may limit their ability to understand and interpret human behavior.[73]

A heavily automated U.S. military may have to field fewer concerns about casualties from a national population that is arguably more sensitive to loss of life than it has been in the past.[74] Unpopular conscription efforts would be unnecessary, and perhaps the Selective Service System would be eliminated.[75] But, a military in which most essential decisions were made by programmers and tech strategists in offices rather than by armed human warriors on the battlefield would be transformed operationally, and the U.S. population would perceive such a military differently. Public esteem for those who serve in the military derives not simply from the fact that they wield high-tech weapons that provide us with security from those who might attacks us, but largely from the reality that individual humans are putting themselves in harm's way and risking their lives in order to protect their country and uphold American values abroad. The rise of

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68. Kastan, *supra* note 5, at 59 (observing that due to the absence of advanced fail-safe systems, currently one of the main ways to disable malfunctioning unmanned weapons is simply to shoot them down).

69. HRW, *supra* note 3, at 28; Schmitt & Thurnher, *supra* note 2, at 239 ("[G]eneral artificial intelligence systems will exhibit human-like cognitive abilities, enabling them to make decisions in response to complex problems and situations.").

70. Schmitt & Thurnher, *supra* note 2, at 242 (conceding that, like all weapons systems, FAW and AI systems would be "susceptible to malfunction").

71. *Id.*

72. On the dangers that artificial intelligence may pose to humanity, see Andrew Leonard Follow, *Our Weird Robot Apocalypse: How* Paper Clips *Could Bring About the End of the World*, SALON.COM (Aug. 17, 2014, 4:00 PM), http://www.salon.com/2014/08/17/our_weird_robot_apocalypse_why_the_rise_of_the_machines_could_be_very_strange/.

73. HRW, *supra* note 3, at 29 ("Even if the development of fully autonomous weapons with human-like cognition became feasible, they would lack certain human qualities, such as emotion, compassion, and the ability to understand humans.").

74. Marchant et al., *supra* note 1, at 288 ("[F]or a number of reasons, American civilians have become increasingly averse to any casualties.").

75. Schmitt & Thurnher, *supra* note 2, at 237 (suggesting that one advantage of FAWs will be that they would enable militaries to conduct fewer "personnel[-]intensive" operations).

FAWs may undermine the nobility or even the legitimacy of military service in the public imagination.[76] This development may make it harder for military actors to command moral legitimacy and political influence in a national democratic debate (unless the presence of the FAWs had already undermined democracy, a possibility considered in Part III).

V. RAGE AGAINST THE MACHINES: CREATING A MOVEMENT TO LIMIT THE USE OF FAWS

Because of the legal, geopolitical, and military risks presented by FAWs, an international legal and political regime needs to be designed to limit their development and prohibit their use.[77] Although current international law may address some of the issues presented by FAWs, a particular governance system specifically designed for FAWs does not yet exist, although it is necessary.[78]

Other classes of highly destructive and legally problematic weapons, such as chemical weapons, biological weapons, nuclear weapons, and land mines, were condemned and restricted only after being developed and manufactured (and, in many cases, used on the field of battle).[79] This demonstrates how difficult it can be to create restrictions on a new and promising category of military technology *ex ante*.[80] Even in the unlikely event that the major world powers all agreed to a preliminary limitation or ban, some may secretly violate this prohibition on developing FAWs, and other nations might openly pursue FAWs in order to gain a military advantage. In that case, the international community would need to create incentives to make it not "worth it" for states to develop FAWs, such as by specifying red lines that will trigger draconian sanctions against any country that moves toward FAW development.[81]

There is a distinct possibility that the world's major military powers will not be able to avoid an arms race for FAWs. If widespread development of these weapons occurs, it is essential that efforts to restrict or limit their use be pursued.[82] As has occurred with chemical and biological weapons, international norms may

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76. This may ultimately hold true for semi-autonomous weapons as well.

77. *See* HRW, *supra* note 3, at 36 ("The development of autonomous technology should be halted before it reaches the point where humans fall completely out of the loop.").

78. Marchant et al., *supra* note 1, at 289 ("At present, there are no laws or treaties specifically pertaining to restrictions or governance of military robots . . . . Instead, aspects of these new military technologies are covered piecemeal (if at all) by a patchwork of legislation pertaining to projection of force under international law . . . and interpretations of existing principles of the Law of Armed Conflict (LOAC).").

79. *See* Kastan, *supra* note 5, at 47 (noting that some scholars have drawn parallels between the rise of FAWs and the emergence of nuclear weapons).

80. *See* Marchant et al., *supra* note 1, at 275 (arguing that the United States has a tradition of successfully introducing new and innovative military technology on the battlefield).

81. *See* Kastan, *supra* note 5, at 63 (discussing FAW opponents' emphasis on preventing proliferation of such weapons).

82. Marchant et al., *supra* note 1, at 291 (decrying the current international law regime as "wholly inadequate to the task" of restricting and regulating FAWs).

be created after development to limit the use of particular weapons in warfare.[83] In the case of nuclear weapons, the most infamous arms race in human history concluded not with nuclear Armageddon, but rather with arms treaties between the United States and the former Soviet Union, which have led to large reductions in the number of existing nuclear weapons since the 1980s.[84] Useful examples exist in the development of these legal regimes that may be applied to crafting international laws restricting FAWs.[85]

Nevertheless, the United States should act first by passing national legislation restricting FAWs, because the process of creating international agreements is often slow and cumbersome.[86] International agreements are also less likely to be complied with and have fewer and less-effective enforcement mechanisms than national laws.[87] Another reason the United States should lead the way in outlawing these weapons is because it is one of the leaders in advancing the technology.[88] Because the United States is still an influential superpower, its prohibition of FAWs could create momentum for other nations to follow suit, and could increase momentum for an international agreement to be reached. Furthermore, given the U.S. government's usual suspicion of international agreements, the United States may be more likely to sign on to an agreement if it were the main power promoting the idea rather than having an agreement pushed on it by European nations.

Some entrenched interests will support development of FAWs. Indeed, the Department of Defense is already taking steps to develop them.[89] Semi-autonomous systems, especially missile defense systems, already are being used in military conflicts, but operate only with human monitoring and oversight.[90]

Some crude FAWs may already exist; foreign governments are currently using "sentry robots" that may have a fully automatic patrol mode, although those

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83. *Id.* at 298 (documenting a campaign to restrict FAWs through an agreement modeled after treaties "restricting nuclear and biological weapons").

84. *See* Eric Auner, *The Cold War is Long Gone, But the Nuclear Threat is Still Here*, ATLANTIC (Dec. 20, 2011, 9:26 AM), http://www.theatlantic.com/international/archive/2011/12/the-cold-war-is-long-gone-but-the-nuclear-threat-is-still-here/249867/.

85. Marchant et al., *supra* note 1, at 289 (listing various conventions in international law restricting specific weapons technologies and practices).

86. *See id.* at 313–14 (providing examples of international agreements that started as frameworks lacking "substantive legal 'teeth'").

87. *Id.* at 1, 305 ("It is worth noting that even the broadest and most aggressively implemented international legal arms control instruments suffer from certain inherent weaknesses."); *see also* HRW, *supra* note 3, at 5 (recommending instead the adoption of national laws prohibiting the "development, production, and use" of FAWs).

88. Marchant et al., *supra* note 1, at 277–78 (describing plans by the U.S. Department of Defense to "shift toward greater reliance on unmanned vehicles").

89. HRW, *supra* note 3, at 6 ("[T]he US Department of Defense has spent approximately $6 billion annually on the research and development, procurement, operations, and maintenance of unmanned systems for war."); Kastan, *supra* note 5, at 52.

90. HRW, *supra* note 3, at 9–11 (describing semi-autonomous missile defense systems that have been used in military conflicts by the United States, Israel, and Germany); Kastan, *supra* note 5, at 50 ("Robotic systems that are currently deployed all retain a 'human in the loop,' where a human operator can veto the decision of the machine.").

militaries officially have kept them under human supervision to this point.[91] As the U.S. Congress considers appropriations for development of FAWs, politicians will likely be influenced by weapons manufacturers who promise jobs and economic benefits to constituents, and by hawkish foreign policy ideological groups convinced that FAWs would be a net boon to national security.[92] The momentum in the debate on "killer robots" is primarily on the pro-FAW side at this point.[93]

Activist outcry against FAWs has already started, although still on a small scale; a coalition of NGOs (including Human Rights Watch and Amnesty International) has formed The Campaign to Stop Killer Robots, which has its own website and social media presence.[94] Establishment of such anti-FAW organizations and promotional campaigns helps promote the public and media awareness that will be necessary to create pressure for Congress to restrict the weapons. NGOs and industry groups could also take action promoting ethical guidelines regarding FAWs in advance of governmental action, but ultimately federal law will be needed in order to make restrictions upon FAWs binding and mandatory.[95]

Greater awareness and national conversation about the imminent development of FAWs is an essential first step.[96] An anti-FAW movement could utilize a "top-down" approach, with individuals such as well-connected scholars at elite universities and think tanks trying to influence prominent government officials, and attempting to persuade wealthy and influential people to support the cause. There could simultaneously be a "bottom-up" approach of creating a grassroots social movement geared toward raising public awareness of the issue and pressuring politicians to take action.

In today's polarized and partisan political environment, getting an anti-FAW bill through Congress would be quite difficult, and might require a rare bipartisan coalition. The argument against FAWs could be framed differently to liberal and conservative audiences, based on the psychological and ideological differences between those groups.[97] For liberals, humanitarian concerns should be

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91. HRW, *supra* note 3, at 13–16 (reporting that South Korean sentries may have an automatic mode and that Israeli unmanned patrol systems may have "autonomous mission execution").

92. *See, e.g.*, Schmitt & Thurnher, *supra* note 2, at 234 (arguing that failing to develop FAWs would be "irresponsible" in light of national security imperatives).

93. *See* Marchant et al., *supra* note 1, at 293–94 (suggesting that the United States has been slow to regulate new technologies, including robotic weapons).

94. *Who We Are*, CAMPAIGN TO STOP KILLER ROBOTS, http://www.stopkillerrobots.org/coalition/ (last visited Oct. 20, 2014); *see also* Marchant et al., *supra* note 1, at 293 (documenting the formation of an NGO called the International Committee for Robot Arms Control that is dedicated to promoting restriction of FAW development).

95. *See* Marchant et al., *supra* note 1, at 306–07 (describing "codes of conduct" as a form of "soft law" that can create norms of ethical conduct in a given industry).

96. *Id.* at 273 ("This article . . . calls for a national and international dialogue on appropriate governance of such systems *before* they are deployed.").

97. On differences in moral psychology between liberals and conservatives, see Todd Zywicki, *Jonathan Haidt on Psychology and Politics*, VOLOKH CONSPIRACY (Jan. 17, 2014, 10:22 AM), http://volokh.com/2014/01/17/jonathan-haidt-psychology-politics/.

emphasized. For conservatives, concern over rapid technological change, emergence of potential military vulnerabilities, and desecration of military traditions should be key talking points regarding FAWs.

Congress should pass legislation to slow the development and ban the use of FAWs, and the U.S. government should undertake diplomatic efforts encouraging other major world powers to do the same. Of course, some policymakers will raise the concern that the United States could be at a military disadvantage if it fails to develop FAWs.[98] Congress would naturally respond to large-scale FAW development by rival powers by repealing national laws against FAW development, if an international arms race became unavoidable. Furthermore, in the unfortunate event that it became militarily or strategically necessary for the United States to repeal a ban even on the *use* of FAWs, such as in a desperate wartime scenario, Congress could also quickly take that action. Absent such dramatic future circumstances, the United States should develop a positive example for other nations by passing national legislation restricting development and banning use of FAWs within the United States.

Domestic law reform is the most immediate and realistic solution to the FAW problem. Nevertheless, domestic and international efforts are not mutually exclusive, but rather mutually reinforcing and beneficial. The United States should avoid being aloof from international agreements in this case, going against past patterns of behavior where the U.S. government endorsed the principles of an international treaty without going through the politically difficult and controversial process of actually signing on to its obligations officially.[99] Following this pattern, some US policymakers may publicly decry the "killer robots" but nevertheless privately push the government to develop them secretly and keep open the possibility of using them. This is in keeping with the general skepticism of the United States with respect to treating international human rights treaties as a source of domestic law, despite the United States's view of itself as a global advocate and defender of human rights.[100]

The United States should use the FAW debate as an opportunity to become more participatory in the international lawmaking process more broadly. It should emphasize precedents in international law that are favorable toward restriction of FAWs.[101] Customary international law also already presumptively bans use of any weapons, including FAWs, which by their very design put civilians at risk.[102] The 1980 Convention on Prohibitions or Restrictions on Use of

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98. *See* Schmitt & Thurnher, *supra* note 2, at 232 ("The United States and its allies have a substantial interest in maintaining a technological edge over potential adversaries . . . .").

99. Marchant et al., *supra* note 1, at 290 (noting that while the United States "has taken considerable interest" in the development of international treaties, it is not a party to several of the major conventions governing military and diplomatic conduct).

100. *See* Jack Goldsmith, *Should International Human Rights Law Trump U.S. Domestic Law?*, 1 CHI. J. INT'L L. 327, 329 (2000).

101. *See* Marchant et al., *supra* note 1, at 297–98 (describing principles and agreements within international humanitarian law that would impose restrictions on FAWs).

102. Schmitt & Thurnher, *supra* note 2, at 250.

Certain Conventional Weapons could be amended to cover FAWs.[103] The use of FAWs may also run afoul of international norms of warfare codified in the Geneva Conventions.[104] These facts could be the first steps for the United States to lead an effort for an international treaty. But an international treaty about FAWs may take decades to negotiate and finalize.

CONCLUSION

The dangers presented by FAWs make a public campaign promoting awareness of FAWs essential to create momentum for an American movement toward common sense national laws restricting this new category of weapons. While international organizations such as the United Nations have recently begun to discuss the legal challenges of FAWs, the United States should not stand by and wait for the international community to address the issue.[105] Because the United States is the world's strongest military power and a leader in FAW development, it needs to take timely steps toward passing national FAW restrictions in order to guard against the dangers presented by such weapons and to set a model for the international community to do the same.

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103. Marchant et al., *supra* note 1, at 300.

104. *See generally Geneva Conventions*, INT'L COMM. OF THE RED CROSS, http://www.icrc.org/eng/war-and-law/treaties-customary-law/geneva-conventions/ (last visited Oct. 20, 2014).

105. *See UN Meeting Targets 'Killer Robots,'* UN NEWS CENTRE (May 14, 2014), http://www.un.org/apps/news/story.asp?NewsID=47794#.VEYvP75bRFI.